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***Options for Managing the Impact of Private
Irrigation Wells and Surface Diversions
on Wetlands, Waterways and Public Water Supplies***

Prepared for:
***Westwood Conservation Commission
and Mass Department of Fisheries, Wildlife
and Environmental Law Enforcement***

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Introduction

In 2002 the EOEA Boston Harbor Watershed Team, organized under the Massachusetts Watershed Initiative identified an urgent need to begin conducting water conservation demonstration projects in each of these problem areas, and requested grant funding from EOEA to get this process started. The Mass. Department of Fisheries Wildlife and Environmental Law Enforcement, Riverways Program was charged with administering the resulting grant and in January 2003, the Neponset River Watershed Association was selected as the prime contractor to complete the project. Alexandra Dawson was recruited as a subcontractor on the project to assist in the development of municipal bylaws.

Shortly thereafter, the Westwood Conservation Commission contacted the Association seeking assistance in determining how they might best respond to requests for new private irrigation wells. This report has been prepared as a response to that inquiry.

The report summarizes available data on the extent and environmental impact of private irrigation wells in Westwood, reviews the current regulatory framework surrounding both private irrigation wells and automated irrigation systems, examines regulations adopted by other towns in this area and recommends various strategies that Westwood and other towns might utilize to minimize the impact of these systems.

The project has received critical input from an informal steering committee consisting of representatives from the Westwood Conservation Commission, the Dedham-Westwood Water District and the Westwood Board of Health. We are also indebted to host of watershed association staff, state and federal agency staff, private consultants, and municipal officials too numerous to list, who shared generously of their time and have been invaluable to the success of the project.

Nevertheless the recommendations and model bylaws included in this report remain solely the responsibility of the Neponset River Watershed Association, and in no way represent the opinions or recommendations of the steering committee or any of its individual members.

Overview of the Streamflow/Groundwater Depletion Problem in the Neponset River Watershed

In recent years there have growing concerns in the Neponset Valley over falling water levels in area waterways, particularly during the dry summer months. Reduced water levels can negatively impact water quality, the health of aquatic life, water based recreation, public drinking water supplies, availability of surface water for fire fighting, and the natural biological control of mosquito populations that occurs in healthy wetlands and streams.

There are many factors which contribute to declining water levels in an urban-suburban watershed such as the Neponset, including:

- increasing public and private groundwater withdrawals to meet the domestic water needs of a growing population, and to satisfy the rapidly growing demand for lawn irrigation water in the summer;

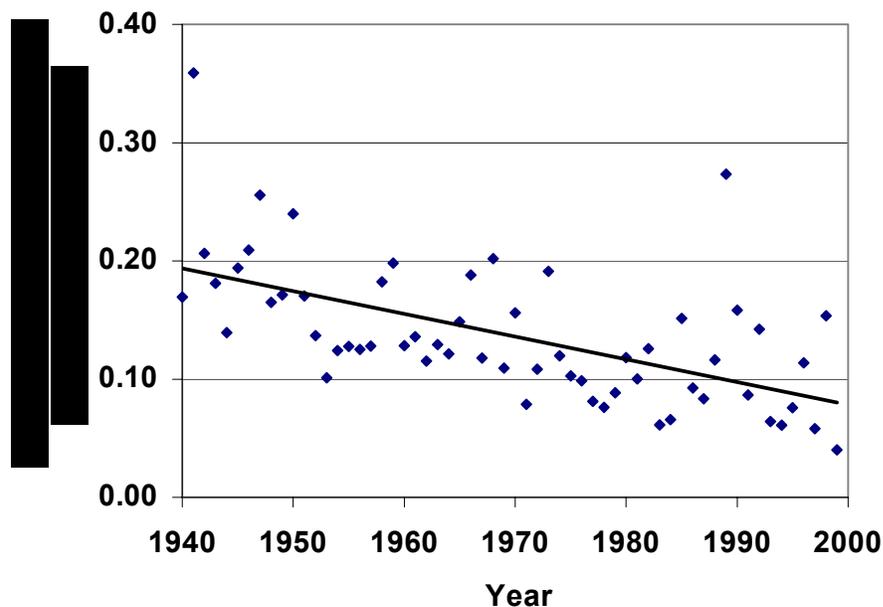
- the expansion of centralized regional sewer systems, which do not return treated wastewater to the Neponset River, as population grows and as existing septic systems are abandoned;
- high rates of “infiltration” of groundwater, and “inflow” of rainwater into those same regional sewer systems as a consequence of deferred sewer maintenance;
- and the impact of new roads, rooftops and other impervious surfaces which impede the recharge of rainwater into the ground.

These changes have taken a significant toll on many of the rivers in eastern Massachusetts. The main stem of the Ipswich River, with a watershed similar to the Neponset’s in size, population, and land uses, now regularly runs completely dry, due in large part to municipal water diversions.

In the Neponset Watershed, while not yet as severe, all the same forces are at work. Here, the sewer system alone flushes away a *net* volume of 10 billion gallons of water each year -- some 20% of the total *annual* flow of the Neponset River. This loss of water along with the impact of impervious surfaces and the growing seasonal demand for lawn irrigation water are contributing to signs of significant hydrologic stress in the Neponset River and most of its tributaries.

As illustrated in figure 1, these changes in the river’s hydrology are visible in historic streamflow records. The USGS “Norwood” Streamflow Gauge shows the Neponset’s “base flow” dropping by more than 50% over the last 60 years.

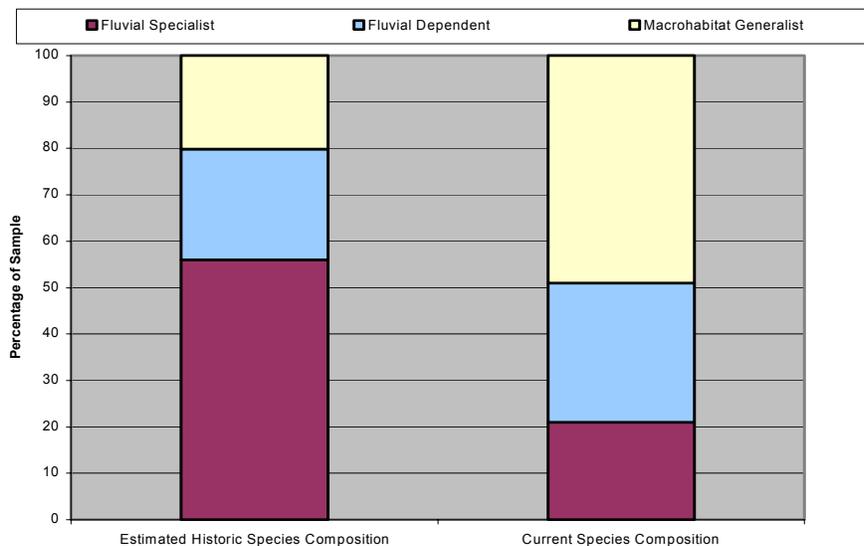
Figure 1: Base Flow at USGS Norwood Gauge: 1940 to 2000



Changes are also evident in the mix of fish species currently found in the Neponset River and its tributaries as compared to the mix of species found in historic fisheries data and in watersheds similar to the Neponset which have not undergone similar hydrologic stress. Fresh water fish species can be broken down into three general categories based on their habitat requirements: Macrohabitat Generalists or fish which can tolerate a wide range of conditions including warm slow moving water or “pond” conditions; Fluvial Dependents which are less adaptable and require moving water habitats and higher oxygen levels for at least part of

their life cycles; and Fluvial Specialists which are quite intolerant of warm, low oxygen and low velocity stream conditions. As figure 2 illustrates there has been a substantial

Comparison of Current and Estimated-Historic Fish Assemblages for Neponset River



shift in population composition among these groups toward fish species which are much more tolerant of warm, low flow conditions. This is a shift which matches the pattern of change in the more severely affected Ipswich River.

These changes in the Neponset River and in other Eastern Massachusetts Rivers has brought

new attention to issues of instream flow management on the part of watershed associations, state and federal regulators, conservation commissions, water suppliers and other stakeholders, and prompted a reexamination of policies that have the potential to further deplete or restore instream flows.

Overview of Private Irrigation Well and Automated Irrigation System Impacts in the Town of Westwood

In affluent suburban communities such as Westwood, growing demand for water to irrigate suburban landscapes is becoming an increasing problem for water suppliers, and wetland resources alike.

Contrary to what many people think, water drawn from a private well or public water supply and applied to a nearby lawn for irrigation is not simply being returned to recharge the watershed from which it was withdrawn. A properly irrigated lawn will take up and evapotranspire 100% of the supplemental water which it receives.

In such communities, water demand often increases by 75 to 100% as summer arrives. This increase places substantial strain on the ability of water supply infrastructure to meet these higher demands and contributes to hydrologic stress in the watersheds from which this additional water is drawn. Because of insufficient infrastructure and maximum pumping limits imposed to protect the Neponset River, the Dedham Westwood Water District does not have sufficient supplies to fully satisfy these seasonal demands and thus is frequently compelled to impose outdoor watering restrictions or “water bans” in order to reduce demand to safe levels. Because of the District’s aggressive application of water

bans, this seasonal demand spike is usually smaller in the Dedham Westwood Water District than in many similar neighboring communities.

In addition to placing a strain on water supply infrastructure, the increased water withdrawals associated with seasonal demands can place acute hydrologic stress on streams and wetlands because these demands tend to be most intense at times when the stream is already under stress as a result of natural drought.

The intensity of peak demands has been aggravated further in recent years by the proliferation of automated lawn irrigation systems. These systems generally involve the installation of a network of sprinkler heads or emitters, fed by underground plastic tubing or above ground garden hoses. These systems are generally controlled by an automatic timing device, and initiate irrigation on a regular schedule without any conscious initiation by a human operator.

In theory such systems can be designed to apply irrigation water very precisely and therefore more efficiently than non-automated irrigation systems. In practice however, because of their automated nature, these systems apply irrigation water much more consistently and often more heavily than the more informal hose and sprinkler systems that were the historic norm. This is especially so as such systems have increasingly migrated from their roots in golf courses and commercial agriculture where irrigation is a professionally managed, mission critical activity, into use by large numbers of mixed commercial and residential users.

As a result, homes and businesses outfitted with automated systems consistently demand much higher annual volumes of water than homes and businesses without such systems. The Franklin Water Department reports that in an informal comparison of water use by homes with and without automated irrigation systems, homes with such systems consumed on average five times more water than the typical household. Another informal survey by the former DPW Director in Sharon found similar results. Ironically such systems are often set to apply more water than the landscape needs, weakening plants through overwatering.

Ironically, the increased strain placed on public water supply infrastructure by the proliferation of automatic systems is a major factor contributing to the early and long lasting imposition of outdoor watering bans by public water suppliers in Eastern Massachusetts.

Because of the high cost of using purified, public, drinking water to irrigate large areas of lawn and because the limitations imposed by municipal water bans, residents and businesses that demand large irrigation volumes have a strong incentive to install private wells as an alternative to irrigating with public drinking water. While a private irrigation well often carries a high initial cost of as much as \$15,000 in Westwood, after installation the water provided is virtually free, available for just the cost of electricity to pump it. Even more important for many such users is the fact that this water is currently exempt from water bans designed to protect the safety of drinking water supplies or to limit environmental impacts to waterways and wetlands.

Private irrigation wells are generally drawing on the same groundwater reserves that support public water supplies and which help sustain summertime water levels in wetlands, ponds and streams. Thus while some water suppliers encourage their customers to shift to private irrigation wells in an effort relieve direct peak demand pressures on public water supply infrastructure, the private wells still contribute to overall hydrologic stress within the watershed and associated impacts to recreation, water quality, aquatic life and other compelling public interests. In some cases, such as when private wells are located within the immediate zone of influence of public wells, they may directly interfere with the ability of water suppliers to provide water.

In some communities, including the Dedham-Westwood Water District, private irrigation withdrawals also have an indirect impact on public water suppliers. Increasingly, state regulators are recognizing the interconnection between water withdrawals and the hydrologic stress in Massachusetts rivers. In an effort to mitigate these impacts, regulators now often restrict the operation major wells when nearby river levels drop below critical thresholds. In the Neponset Valley, both the Dedham-Westwood Water District's Fowl Meadow Well and the Town of Canton's Well #9 face such restrictions. During the summer of 2002 the Dedham-Westwood Water District had to shut down its Fowl Meadow well during a period of peak demand because of a low flow event in the Neponset River.

Overuse of private irrigation wells contributes to reduced instream flow levels, thus increasing the likelihood that communities whose water supply permits include streamflow triggers will have to stop pumping. In short, public drinking water sources must be shut down when the river gets too low, and private irrigation wells are an important contributor to lowering water levels in the river and its tributaries.

The Westwood Board of Health, like most Boards of Health in Massachusetts, maintains records of private wells used for drinking or irrigation. In Westwood's case (as described further below) a very basic recordkeeping system was begun in the 80's. However, these records are of limited detail through 1999. In 2000 the Westwood Board of Health adopted a new Private Well Bylaw and complete from this date forward.

Board of Health records indicate 262 known private wells in Westwood of which 86 are specifically listed as irrigation wells, although any of these wells may be used for irrigation. Board of Health staff indicate that they believe their records, particularly for the drinking water wells, are fairly complete. Westwood's private irrigation well records are summarized in Table 1.

**Table 1: Summary of Westwood Board
of Health Records on Private Wells**

Year Completed	All Wells	Irrigation Wells	% Irrigation
Completed Before Bylaw (17% of all wells)			
1982	1	1	100%
1985	1	1	100%
1989	1	0	0%
1990	3	2	67%
1992	1	0	0%
1993	4	1	25%
1994	3	2	67%
1995	2	2	100%
1996	1	0	0%
1997	3	1	33%
1998	4	3	75%
1999	21	20	95%
Subtotal	45	33	73%
No Completion Information (presumably before bylaw, 65% of all wells)			
blank field	48	8	17%
No date on report	4	1	25%
No information	101	4	4%
Not complete	18	5	28%
Subtotal	171	18	11%
Subtotal Completed Before Bylaw + No Completion Information (82% of all wells, avg 12 wells per year, 3 irrigation per year)			
	216	51	24%
Completed Since Bylaw (17% of all wells, avg 14 wells per year not incl 2003, 11 irrigation per year)			
2000	13	13	100%
2001	9	5	56%
2002	21	15	71%
2003	3	2	67%
Subtotal	46	35	76%
Total	262	86	33%

The most striking observation from the records is that there is only partial information on the majority of the wells. In 2000, 2001 and 2002, the full years since the bylaw was adopted, an average of new 14 well applications were received per year. This appears to be an overall 16% increase in new applications over historic levels assuming records prior to 1999 are reasonably accurate. Thus it appears that new well applications are on the rise.

It also appears that irrigation wells comprise a much higher percentage of new well applications than has been the historic norm. Irrigation wells make up some 76% of applications since 2000, as compared to just 33% of historic applications, though again the incomplete records make a precise determination impossible.

In addition to the records maintained at the Westwood Board of Health the Mass Department of Conservation and Recreation (DCR) maintains a database of well completion reports submitted under the State Well Drillers Registration Program. DCR staff indicates that their records are usually more complete than records maintained by the individual towns. However, they indicate that the completeness of even the DCR records is subject to the degree to which well drillers have participated in the mandatory reporting process over time. The degree of compliance with this process has reportedly varied over time, with a substantive compliance enforcement being a relatively new phenomenon. Thus it is likely that there are at least some additional irrigation wells in Westwood of which the Board of Health is not aware.

Even under Westwood's new bylaw, there is no requirement to meter water use from private wells, making it impossible to determine exactly how much of a collective hydrologic impact these wells might be having. However, we have estimated total seasonal water demand for private irrigation wells in Westwood based on the available information.

To prepare the estimate we looked at a range of assumptions in terms of the number of wells actually in use for irrigation purposes, and the area being irrigated for each well. We then assumed conservatively that active irrigators were applying one inch of supplemental water per week when irrigation was needed. However, it was the consensus of the Steering Committee that most irrigators were likely to apply more than the recommended one inch per week in practice. As illustrated in table 2, this estimate ranges from 1.02 to 0.25 million gallons of water per day as an aggregate demand for all irrigators under present conditions. We also estimated a range of aggregate demand after an additional 15 years of new well installations at historic rates, finding estimated future demands of 1.71 to 0.60 million gallons per day in 2018.

The Committee had also discussed the possibility of estimating water use by private well owners, by using "second meter" data from the Westwood Department of Public Works. The DPW allows homeowners to install a second water meter, which measures only outside water use. The readings from these second meters are then deducted from the homeowner's sewer bill since the water was not discharged into the sewer. We expect that water use by those with second meters would represent some of the Town's heavier water users, since they had taken the trouble to install a second meter at a cost of several hundred dollars. However, we would also expect use by second meter customers to be significantly lower than use by those with private wells because per gallon costs are still considerably lower for private well users and they are exempt from water bans. Unfortunately we were not able to obtain second meter data from the Town in time to incorporate it into this report.

Table 2: Estimates Private Irrigation Well Use in Westwood, Excluding Water Management Act Permittees

Scenario	Assumed Number of Active Wells	Assumed Irrigated Acres Per Well	MGD	Cubic Feet Per Second
Present Day				
all @ 1 acre	262.00	1.00	1.02	1.57
all @ 1/2 acre	262.00	0.50	0.51	0.79
half @ 1 acre	130.00	1.00	0.50	0.78
half @ 1/2 acre	130.00	0.50	0.25	0.39
After 15 year's Growth at Historic rate of 12 Irrigation Wells per Year				
all @ 1 acre	442.00	1.00	1.71	2.65
all @ 1/2 acre	442.00	0.50	0.86	1.33
half @ 1 acre	310.00	1.00	1.20	1.86
half @ 1/2 acre	310.00	0.50	0.60	0.93

Because private well use is not metered it is impossible to precisely determine the magnitude of their impact, however, we feel confident that demand is within the range in Table 2 above. At the higher end of the range, the withdrawal is equivalent to an additional major municipal well, and over the relatively short time horizon of 15 years, rises to the level of two major municipal wells. At the lower end of the range this withdrawal still represents a significant percentage of total flow in small and medium sized tributaries, particularly during drought periods when one would expect private irrigation wells to be used most heavily.

Of further concern is the likely prospect that these impacts are similar across other affluent, low-density Neponset Valley communities including Medfield, Dover, Sharon Foxborough, Canton, Walpole and perhaps Dedham. Taken together those cumulative impacts, even when using the low end of future demand, would represent several times more than the total flow of the Neponset at the Norwood Gauge during drought conditions.

While the primary focus of this report is the issue of private irrigation wells, there is another important source of private irrigation withdrawals in the Neponset Valley: private surface water diversions. Unfortunately, there is even less information about these surface diversions than there is on private wells. While in theory, most of these diversions would require and order of conditions under the Wetlands Protection Act, in NepRWA's experience they are generally installed without any permit applications, and there is no organized record of such diversions in any Neponset Valley Town to the best of our knowledge.

While it is impossible to accurately enumerate such surface diversions, our past experience with shoreline surveys and other field investigations indicate that they are fairly common. Such surface diversions from ponds, streams and wetlands have the

money saving advantages of a private irrigation well, without the high initial installation cost. Such diversions vary from small residential uses, to any number of larger condominium complex or commercial situations. Based on our own experience in the field, NepRWA would speculate that most Neponset Valley communities have not less than 25 such diversions, and perhaps as many as 100.

As is the case with private surface water diversions, there are no organized records of the number of automated irrigation systems in use in the Town of Westwood, be they connected to a private well, or the public water supply. While inquiries at several Neponset Valley municipal plumbing departments produced varied responses, it appears that the installation of an in-ground irrigation system does not require a plumbing permit in Massachusetts. However, if the irrigation system is connected to the public water supply via a new “hard” connection rather than via an existing spigot, a plumbing permit will be triggered for the hard connection, but not the irrigation system. A careful review of records at the Westwood Plumbing Department as to what if any records might exist indicating the potential number of hard piped irrigation systems was beyond the scope of this project.

Overview of the Regulation in the Town of Westwood

In designing a strategy to manage the impacts of private irrigation wells, surface water diversions and automated irrigation systems in the Town of Westwood it is important to begin with an understanding of the overall pattern of laws and regulations that govern water use. This framework has common elements in communities across the Commonwealth, but varies somewhat in its particulars from community to community. The specific regulatory framework that applies to the Town of Westwood is described below. Copies of relevant existing bylaws and regulations, or references for where than can easily be found online are included in Appendix A.

Dedham-Westwood Water District Regulations

The Town of Westwood is somewhat unusual among Neponset Valley communities in that public drinking water is supplied and regulated on a two town regional basis by the Dedham-Westwood Water District, rather than by the more typical single community, municipal water department. As a result, regulations pertaining to the use of the public water supply exist as regulations promulgated by the Water District, rather than as a municipal water use bylaw as is the case in most other communities.

The Dedham-Westwood Water District or “the District” was created in 1985 as a regional governmental entity through special legislation enacted by the Commonwealth of Massachusetts. The District’s legislation empowers it to supply water to the two towns, construct and operate water supply infrastructure, assess fees to residents of the two towns to finance infrastructure and operating costs, regulate the use of the water that it provides, and even exercise the power of eminent domain in order to acquire water supplies as needed. The District conducts its duties under the direction of a six member Board of Commissioners appointed by the Selectmen of the two towns.

Over the years, the District has developed a comprehensive schedule of regulations under this authority governing all aspects of its operation. However, it is the District’s Water

Conservation Policy that is primary interest for our purposes. The District's water conservation policy establishes a series of seven increasingly stringent levels of water use restrictions which are triggered based on the ratio between their supply system's estimated safe yield and the weekly average water demand. These restrictions range from voluntary "odd/even" ban during which the public is asked to voluntarily refrain from unnecessary outdoor water use, to a variety of mandatory restriction levels, which in the most extreme circumstances prohibit all uses of water not "essential to life, health and safety."

The Water Conservation Policy also establishes a schedule of fines for customers who violate any of the mandatory water restriction levels. The fines begin with a warning for the first offense, a \$100 fine for the second offense, and a \$250 fine for the third or subsequent offense and can culminate in the discontinuation of water service for repeat offenders. Fines are levied under this policy on the basis of "tips" received from concerned customers and by periodic reconnaissance by District staff.

Another important feature of the District's operation is defined by their Water Management Act and Interbasin Transfer Act permits for its newest Fowl Meadow Well. In recognition of the increasing hydrologic stresses in the Neponset Watershed, these state permits require that the District shut down the Fowl Meadow Well whenever the river reaches a critical low-flow threshold. The river is most likely to reach these critical cutoff flow levels during periods of drought, exactly the same time when outdoor water demand places the greatest strain on the District's supplies. When activated, this requirement, while necessary to protect the river, places intense pressure on the District's infrastructure, and can quickly raise the water conservation level to its highest stage. Any activities that contribute to lowering instream flow levels, be they private irrigation, impoundment manipulation or loss of groundwater recharge, also contribute to the potential for health and safety problems as the District's pumping capacity is restricted.

Water Management Act and Interbasin Transfer Act

The Water Management Act is the primary state law regulating public and private surface and groundwater withdrawals. It is administered by the Department of Environmental Protection and applies only to withdrawals with an annual daily average volume of 100,000 gallons per day or more. The Interbasin Transfer Act is a state law regulating the transfer of water between watersheds for water supply, wastewater or other purposes. The Interbasin Transfer Act is administered by the Massachusetts Water Resources Commission and generally applies only to transfers of 1,000,000 gallons per day or more. While these are the principal laws governing most public water supply activities, and some private water users such as heavy industries and golf courses, they are generally not applicable to the withdrawals associated with private suburban irrigation, which are relatively small when taken individually. Copies of the Water Management Act and Regulations are available online at www.state.ma.us/dep/matrix. The Interbasin Transfer Act and Regulations are available online at www.state.ma.us/envir/mwrc.

Guide to Lawn and Landscape Water Conservation

As discussed above the Massachusetts Water Resource Commission is the primary state agency charged with water supply planning, management and permitting activities in

Massachusetts. The WRC has also developed the Massachusetts Guide to Lawn and Landscape Water Conservation. This document provides extensive recommendations for municipalities, water suppliers, homeowners and businesses as to how best regulate and manage outdoor water use to maximize efficiency and limit potential conflicts between landscape irrigation, instream flow preservation and critical water supply needs. While not having the effect of direct regulation, this document provides authoritative guidance on the subject, and forms the basis for many of the recommendations in the later sections of this report. Copies of the guide are available online at: www.state.ma.us/envir/mwrc.

Well Drillers Registration Program

Chapter 21, section 16 of the General Laws of the Commonwealth, enacted in 1962, establishes a program of Well Driller Registration to ensure that well drillers in Massachusetts are appropriately qualified, and to ensure that records of wells drilled are maintained. DCR is charged with administering this law and has adopted regulations (313 CMR 13, adopted in 1997) to guide its work. DCR conducts well driller exams, maintains a list of registered drillers, fields complaints about well drillers and maintains a database of the well completion reports which must be submitted to DCR and the local Board of Health every time a well is drilled in Massachusetts. In addition to these general provisions, Chapter 21, section 16 specifically reserves the right of cities and towns to require that a “site permit” be obtained for a well in order to protect public health and safety. A copy of Chapter 21 section 17 is included in Appendix A. A copy of the well driller’s regulations can be found online at www.state.ma.us/dcr/programs/welldrill (however given the recent agency reorganization this web address is likely to change soon).

Massachusetts Wetlands Protection Act

The Massachusetts Wetland Protection Act and its associated regulations, protect the public interest in wildlife habitat, water supply, flood prevention and other considerations associated with the functioning of healthy wetland resources. Any activity within 100’ of specified wetland resource areas, or within 200’ of a perennial stream is subject to the Act’s jurisdiction. Decisions under the Act are made by locally appointed Conservation Commissions, but those local decisions may be appealed to the state Department of Environmental Protection, and ultimately to the courts.

The Massachusetts Wetlands Protection Act and its regulations make no specific reference to the issue of private irrigation wells, or private surface diversions. However, because the Act regulates activities, which would dredge, fill or alter wetlands, it provides a basis for regulating the hydrologic impact of private wells and surface diversions, at least within the relatively small geographic area of a watershed, which is subject to Wetlands Act jurisdiction.

Generally the Wetlands Protection Act focuses on regulating activities that have a direct impact on wetland resource areas. The classic example would be the regulation of well construction activities such as excavation on the stream bank, installation of access roads through a marsh, or the actual digging of a well in a wetland.

The Act also recognizes that an action such as the withdrawal of water directly from a resource area (either by taking it out at the top via a surface diversion or taking it out at the bottom via a well) is a subject to regulation, though the exact standard each activity must meet depends on the resource area being affected. Clearly a private surface or groundwater diversion constructed in a wetland resource area or the buffer zone, where the diversion would lower the water level in a wetland, thereby changing the community of plants or wildlife in the wetland, could be prohibited by a Conservation Commission under the Wetlands Protection Act or could be permitted with conditions necessary to protect the resource area.

The Wetlands Act even empowers the Conservation Commission to regulate water diversions which are constructed outside its jurisdiction, but which are actively having a clear impact on a regulated resource area. However, this authority to regulate indirect impacts is applicable only after the fact, once the Commission can demonstrate that actual damage is occurring. Thus the Commission cannot prevent a homeowner from building a private irrigation well 101 feet from a wetland (i.e. just outside their jurisdiction). However, if the wetland dries up as soon as the well is turned on, the Commission does have the authority to regulate the operation of the well in order to protect the resource area. While this authority exists, it is very seldom utilized because of the practical inherent in attempting to assert regulatory control of an activity “once the horse has already left the barn.”

In Westwood, the Board of Health (which has primary responsibility for regulating private irrigation wells as described below) has had a longstanding practice of notifying the Conservation Commission whenever they receive an application of a new well be it for drinking water or for irrigation. However, most applicants, realizing this additional requirement will be imposed, take steps to locate their well in an area of their property which is outside of Conservation Commission’s jurisdiction. As a result, only one of the 46 wells proposed since 2000, has been subject to permitting by the Westwood Conservation Commission. Copies of the Wetlands Protection Act and Regulations are available online at: www.state.ma.us/dep/matrix.

Westwood Conservation Bylaw

In addition to the authority that they exercise under the Wetland Protection Act, the Westwood Conservation Commission also administers the Westwood Wetland Protection Bylaw. Enacted by the Westwood Town Meeting in 1989 under the Town of Westwood’s home rule authority, the Westwood Wetland Protection Bylaw provides a set of rules parallel to, but significantly more inclusive than the Mass Wetlands Protection Act. Among other significant provisions, the Bylaw establishes a 35 foot “no-build” zone around wetland resource areas which strengthens the basic buffer zone reporting requirements of the Act.

As currently drafted, the Westwood Wetland Protection Bylaw contains no specific reference to private wells or surface water diversions. However, the language of the Bylaw gives the Commission substantially broader powers to regulate water diversions than those it administers under the Wetlands Act. Most importantly, the Bylaw empowers the Commission to prospectively regulate activities which it believes are “likely” to have

a “significant or incremental effect on wetlands,” irrespective of whether those activities take place in a resource area or the buffer zone. This is a dramatic change from the powers in the Act which allow activities outside resource areas and the buffer zone to be regulated only once significant environmental damage has actually occurred. The Bylaw also allows the Commission to require applicants to cover the cost of experts hired by the Commission to review hydrologic and other technical data. It allows the Commission to deny an application if the proposed activity fails to prevent unacceptable incremental effects on wetlands and it explicitly defines a change to the “water level” or “water table” as an alteration subject to regulation. Finally the Bylaw allows the Commission to promulgate its own regulations to “effectuate” the Bylaw after public notice and a public hearing.

Westwood Board of Health Regulations

In Massachusetts, local boards of health have very broad powers to enact their own regulations as needed to protect public health. In addition, Boards of Health are often charged with administering various bylaws enacted by Town Meeting.

In Westwood, the installation and operation of private wells for irrigation and or drinking is regulated mainly by Westwood Board of Health’s Private Well Regulations. These regulations are primarily designed to address water quality concerns, and the ability of wells to reliably provide sufficient volumes of water for indoor household use. They provide specifications for where wells can be located relative to likely pollution sources and required installation practices. Relevant requirements include minimum setbacks of 25 feet from rivers, streams and ponds and a prohibition of wells in the aquifer protection district as set up in the zoning bylaw. The regulations also prohibit wells less than 100 feet deep, and establish procedures for formally decommissioning any well not used in the last three years.

The regulations require that all private wells obtain a permit from the Board of Health whether they will be used for drinking or irrigation. The permit requires a submission of a pump test report to verify that the well meets the Board’s volume requirements which are oriented toward residential drinking water needs. The permit also requires successful completion of a water quality test. The water quality test is for a comprehensive suite of potential contaminants in the case of a private drinking water well and for the more limited suite including bacteria and Massachusetts Secondary Contaminants in the case of an irrigation well. The water testing requirements are triggered not only upon initial application to install a well, but also any time a home with an active well is sold. The regulations do not address private surface water diversions used for irrigation. These comprehensive rules are largely based on the model bylaw recommended by the Massachusetts Department of Environmental Protection. The major changes from the model include the prohibition against shallow wells and prohibition of private wells in the water resource protection district.

Zoning Regulations

The Town of Westwood’s Zoning Bylaws are administered by the Planning Board and Zoning Board of Appeals. These rules define many aspects of the shape, location and manner of development in Westwood and the infrastructure which supports that

development. The zoning bylaws in Westwood include a Water Resource Protection Overlay District designed to help prevent contamination of groundwater sources used for public drinking water purposes by regulating high risk land uses in recharge areas. This overlay district defines the area within which the Board of Health prohibits irrigation wells as described above. While some communities have adopted zoning rules such as maximum lawn size designed to minimize unnecessary irrigation, there are no such bylaws in Westwood.

Plumbing Code

Virtually all activities involving even the most minor plumbing in a home in Massachusetts must obtain a plumbing permit and be completed by a licensed plumber in accordance with the provisions of the State Plumbing Code. However, plumbing activities more than ten feet from a residence are exempt from the permit requirement. As a result private wells used solely for irrigation (i.e. not plumbed into the house) and any irrigation system connected to such a well are exempt from the permit requirement. In the case of an irrigation system connected to the public water supply, the spigot that brings water to the outside of the house is subject to a plumbing permit, but the irrigation system connected to that spigot is currently exempt.

Overview of Relevant Bylaws and Policies Adopted in Other Massachusetts Municipalities

Before preparing specific recommendations for the Town of Westwood, NepRWA completed a search for other communities who have already adopted relevant bylaws and or policies. We were surprised by how many communities we were able to identify that have already taken some action to regulate the impact of private irrigation wells and irrigation systems. A summary of the existing regulations which we found is provided in table 3, whenever possible, the full text of the regulation or policy is included in Appendix B.

A range of legal mechanisms were used to implement the regulations we found from formal bylaw adoption to less formal promulgation of regulations. In all, 10 communities simply ban in-ground or automatic irrigation systems connected to the public water supply, with one community applying that ban retroactively to existing commercial systems. Four communities have specific design/performance standards or detailed permitting application processes for irrigation systems connected to the public water supply and two have such requirements for irrigation systems connected to private wells. Two communities have restrictions on where private irrigation wells can be placed that go beyond the standard board of health, water quality oriented requirements. Two communities require special landscaping treatments designed to minimize the need for irrigation. One community requires that those irrigating with private wells abide by outdoor water bans under specific conditions.

This survey of existing regulations represents a significant, though not exhaustive effort to find communities that have taken action in these areas. There are undoubtedly communities that have taken action beyond those listed here. This is especially so in the case of zoning rules designed to minimize the need for irrigation through thoughtful site

design. Nevertheless, it is clear that many communities have been faced with this same set of issues and have responded with a wide array of regulatory strategies.

In addition to the existing municipal bylaws and regulations, we reviewed the latest round of state Water Management Act permits being reissued for the Ipswich River Watershed. While these permits are not yet final because they have been almost universally appealed by water suppliers and conservation interests alike, they do indicate DEP's belief that it is both appropriate and necessary for communities to begin tying outdoor watering restrictions to instream flow levels, and to begin extending those restrictions to people using private well water for irrigation. In short the DEP permits set two instream flow thresholds for the Ipswich River, a relatively high "caution" threshold at which public water suppliers must impose voluntary irrigation restrictions, and a lower "danger" threshold at which water suppliers must impose total outdoor water bans.

The permits go on to direct the regulated communities to adopt local regulations needed to extend this system of streamflow based outdoor watering restrictions to those irrigating with private well water. It is also significant to note that the streamflow triggers included in these permits are substantially higher than the streamflow triggers in the Dedham Westwood Water District's permits. The "danger" level in the Ipswich is more than twice as high as the single threshold on the Neponset for Dedham Westwood. A copy of one of these Water Management Act permits is included in Appendix B.

Table 3: Summary of Existing Municipal Regulation of Private Wells and Irrigation Systems

Agency	Issues	Enacted By	Summary
Acton Water Supply District	irrigation systems	regulation	requires moisture sensor, backflow prevention, pre-installation notification, applies to new and existing systems
Town of Falmouth	irrigation systems	zoning bylaw	xeriscape required unless private well or drip/mist irrigation used
Town of Falmouth	private well water bans	bylaw	bans apply to private well irrigators when selectmen declare groundwater emergency
Northborough Water and Sewer Commission	irrigation systems	regulation	no new irrigation systems on public water, enacted 1985
Town of Westborough	irrigation systems	bylaw	no new underground sprinklers on public water, existing commercial systems must move to private well in one year, enacted 1996
Norfolk Water Department	irrigation systems	regulation	no new underground sprinklers on public water, enacted 1991
Stoughton Board of Health	private well irrigation systems	regulation	requires detailed design and pump test information before allowing irrigation system on private well
Walpole Water and Sewer Commission	irrigation systems	regulation	no new "outside irrigation systems" on public water, xeriscaping required
Mashpee Water District	irrigation systems	regulation	no new "automatic outside irrigation" systems on public water, existing systems may not be enlarged and require rain sensor, low flow heads and max 0.5 inch per week
Town of Sudbury	irrigation systems	bylaw	no new or expanded in ground irrigation on public water, permit for irrigation system from BOH, 100' wetlands setback for wells, moisture sensor and IPM plan required
Dedham Board of Health	irrigation wells	bylaw	new irrigation wells prohibited in water resource district
N. Andover Water District	irrigation systems	regulations	irrigation systems on public water require backflow preventer, rain sensor and second meter
Holliston Water Department	irrigation systems	regulation(?)	no irrigation systems on public water, no copy in appendix
Sterling Water Department	irrigation systems	regulation(?)	irrigation systems require rain sensor, no copy in appendix
Bridgewater Water Department	irrigation systems	regulation(?)	no irrigation systems on public water, no copy in appendix

Recommendations For Westwood and Model Language

The Steering Committee discussions identified several key issues and obstacles to an effective program of regulating irrigation wells and irrigation systems. Chief among these is that fact that the authority, responsibility and expertise for managing various aspects of these problems are distributed across several municipal agencies. As a result, the best regulatory approach will involve closely coordinated, but relatively modest changes to the rules of several agencies rather than a single bylaw.

Another critical consideration is the fact that all the municipal agencies potentially involved are already working at or over the capacity of their current staffs and thus the preferred approach should place as little administrative burden on each agency as possible. Again an integrated approach with distributed responsibilities promises to be the most effective.

Ultimately the Steering Committee divided the issue into three areas that were the most urgent. These are: to prohibit the installation of new irrigation wells near sensitive resources; to establish consistent design and performance standards for the efficient use of irrigation systems irrespective of the water source; and to extend outdoor watering restrictions to those using private irrigation wells during periods of hydrologic stress. Recommendations for action in each of these areas are discussed below. Model language needed to implement the recommended actions is included in Appendix C where applicable.

Protecting Sensitive Resource Areas

Recommendation #1: The Westwood Conservation Commission should adopt a regulation establishing a presumption that private wells and surface diversions within the riverfront area or buffer zone have an adverse impact on wetland resources.

Recommendation #2: Once the Conservation Commission has implemented recommendation #1, the Westwood Board of Health should modify its private well regulations to make wetland and stream setbacks consistent with the new Conservation Commission regulations.

We are recommending a relatively limited action by the Conservation Commission at this point. Such an action is clearly within the Commission's existing authority under the Westwood Wetland Protection Bylaw, and can be implemented with minimal effort through a straightforward public notice and hearing process. The follow on action by the Board of Health also requires a minimum of effort.

In fact, the existing Wetlands Bylaw provides the Commission with all the authority it would need to effectively ban all irrigation withdrawals in the Town, if the Commission were inclined to do so. Given the overall decline in instream flow levels, a compelling case can be made that all nonessential water withdrawals in the Town of Westwood have an "unacceptable incremental effect" on wetland resources, the threshold established in the conservation bylaw.

Early on in the discussions we had considered recommending that the Conservation Commission define a more expanded area around wetland resources within which private irrigation withdrawals would be banned, perhaps 300 feet. The premise behind such an approach would be that wells located closer to resource areas are more likely to have a direct hydrologic impact on that resource area. While the Commission could undertake such an approach without requiring Town Meeting action, we have not recommended this as the preferred approach at this time.

Some commenters argued that because most private irrigation wells are relatively deep bedrock wells, that they either have no effect on surface hydrology, that the water drawn from such wells could be coming from hundreds of miles away, or that it would be impossible to define a defensible distance within which wells should be banned given the vagaries of bedrock fracture patterns. It is indeed impossible to say exactly where the water in a small bedrock well in New England is coming from, however contrary to the objections above, water drawn from such a well is most likely connected to surface water features within a relatively short distance from the well head. Most importantly, the probability that the well will impact surface water features increases steadily as proximity to the feature increases.

If the Commission wanted to pursue this type of expanded buffer zone approach, one defensible method for establishing a buffer distance would be to use one of several rules of thumb, such as the Theis Method, for estimating the distance required to generate a minimal drawdown effect given the typical pumping rate of a small well. The EPA documents entitled “Guidelines for Delineation of Wellhead Protection Areas” and “Delineation of Wellhead Protection Areas in Fractured Rock,” along with the recent USGS publication “Delineation of Water Sources for Public-Supply Wells in Three Fractured Bedrock Aquifer Systems in Massachusetts” provide additional information and are available at the NepRWA office, if the Commission wishes to pursue this approach.

However, in the end we did not recommend that the Commission pursue an expanded buffer zone approach for several reasons. First is that private residential irrigation wells taken individually have relatively small impacts, and the degree of that impact is most significant only on a seasonal basis when natural water levels are lowest, and irrigation demands highest. Second, because the problem is the cumulative impact of many small wells across the entire watershed, the priority should be to regulate the vast majority of all private wells not just those near wetlands. However, it is probably not politically feasible for the Commission to completely ban the installation of private wells everywhere in the town. For both these reasons, we felt that focusing on a measure regulating the USE of all private irrigation wells based on seasonal water shortages would be a more effective tool for pursuing the objective at hand.

The Commission should however, consider establishing a volume threshold above which any new surface or groundwater diversion would be presumed to have an impact on wetland resources, irrespective of its distance from the resource area. Doing so would at least provide a safety net, for relatively large withdrawals that fall below the threshold for Water Management Act review, and at least set the stage for requiring appropriate

mitigation measures. An appropriate threshold might be 10,000 gallons per day, roughly the amount of water needed to apply 1" of water per week to an area of 2.5 acres. Unfortunately there was not enough time to fully develop this strategy within the project timeframe.

Design and Performance Standards for Irrigation Systems

Recommendation #3: The Dedham Westwood Water District should amend its water conservation policy to establish performance standards and design requirements to ensure the efficiency of irrigation systems connected to the public water supply.

Recommendation #4: Once the Dedham Westwood Water District has implemented recommendation #3, the Westwood Board of Health should amend its Private Well Regulations to incorporate identical efficiency standards for irrigation systems using private wells.

Recommendation #5: Once recommendations #3 and #4 have been implemented, the Water District, Board of Health, Conservation Commission and NepRWA should develop and jointly disseminate a common set of educational and administrative materials to ease implement the new regulations.

Early on in the Steering Committee's discussions it was agreed that irrigation systems, particularly automatic irrigation systems have extraordinary potential to waste water in ways that is of no benefit to anyone's landscape. The Committee also agreed that while one could argue over other elements of the program, there really is no credible objection that can be raised in defense of irrigation practices which are simply wasteful. The committee also agreed that wasteful irrigation system operation is equally indefensible whether it is public drinking water or privately pumped groundwater that is being wasted.

There is, based on our survey of other communities, ample precedent for simply banning automatic irrigation systems connected at least to the public water supply. However in most cases, these rules have the effect of simply shifting demand and wasteful practices from publicly pumped groundwater into privately pumped groundwater sources. The Water District also expressed reluctance to move forward with a simple ban on irrigation systems on the public water supply at this time. Hence, we are recommending parallel sets of regulations at the Water District and Board of Health to ensure that all irrigation systems are operated efficiently. It is important to note however that establishing a program of design standards that has the potential to be effectively enforced entails significantly more administrative complexity than a simple ban.

The Committee also had a long discussion of the practical difficulties and the lack additional staffing needed to fully enforce such regulations. In spite of these limitations, it was agreed that a common set of regulations would be an essential starting point and foundation for a more forceful education campaign. It was also agreed that it would be easier to change the behavior of the vast majority of law abiding homeowners with regulations in place than without them, even if there are limited resources available for enforcement initially.

The recommended language included in Appendix C is based primarily on the guidance in the Massachusetts Guide to Lawn and Landscape Water Conservation. Specifically the recommended language is designed to:

- Establish basic, common sense standards for all irrigation systems, be they in – ground, automatic or informal
- Establish additional requirements for systems that will initiate watering automatically;
- Establish a consistent set of penalties irrespective of the source of water; and
- Bring existing systems into compliance with the new guidelines over time with a minimum of administrative burden and controversy.

Extending Outdoor Watering Restrictions to Private Irrigation Wells

Recommendation #6: The Dedham Westwood Water District should revise its criteria for declaring seasonal water use restrictions to better anticipate events requiring a shutdown of the Fowl Meadow Well and to more explicitly describe current streamflow and groundwater conditions.

Recommendation #7: The Dedham-Westwood Water District, Westwood Police, Westwood Conservation Commission and Westwood Board of Health should evaluate the possibility of using a joint enforcement approach to implementing the bylaw described in Recommendation 8 as well as the existing Water District water ban policy.

Recommendation #8: The Westwood Conservation Commission, Board of Health and the Water District should cosponsor a general bylaw that would establish restrictions on the use private irrigation wells during periods of hydrologic stress.

For most of the year, the volume of private irrigation wells and surface diversions, even when taken together, are relatively small in comparison to the overall volume of the Neponset and most of its tributaries. However, during critical periods, particularly during natural drought events, the impact of such diversions is very significant - when pumping increases at the same time that wetlands most need replenishment from overtaxed groundwater reserves. This situation suggests that a regulatory scheme that focuses on regulating the seasonal use of private irrigation withdrawals in response to hydrologic stress will be equally effective and less overreaching than an effort to prohibit the installation of such diversions across the entire landscape.

This is exactly the approach required of Towns by DEP in the new Ipswich River Watershed Water Management Act Permits. It is also the approach successfully implemented in the Town of Falmouth. Significantly, the Falmouth bylaw has been reviewed and endorsed by the Attorney General (see Appendix B).

While the Board of Health would theoretically have the authority to establish such a rule through regulation rather than Town Meeting action, such a regulation would be

politically infeasible. Thus implementing such an approach would require adoption of a new bylaw by the Westwood Town Meeting.

The key to establishing such a bylaw, and defending it in the event of a legal challenge, will be to ensure that private well watering bans are declared in response to environmental indicators of threats to public health, public safety, water quality or environmental resources from continued, unrestrained groundwater pumping. The key to political acceptability of implementing such a ban will be that it provides for equitable treatment of those using public and privately pumped groundwater for irrigation. Finally the key to successful implementation of such a measure on an administrative level is to assign roles and responsibilities to agencies already playing similar functions.

In order to meet all these objectives the proposed model bylaw gives the authority to declare a state of hydrologic stress to the Water District, which is already monitoring river levels and groundwater levels and evaluating when to impose use restrictions on public water irrigators.

We recommend that the Dedham Westwood Water District revise its water conservation policy to more explicitly include measures of hydrologic stress into its system of triggers for declaring various levels of water bans. Currently the District's written policy is to declare bans based on the ratio between weekly demand and safe yield. While safe yield indirectly incorporates the concept of hydrologic stress, it does not directly reflect the influence of lowered groundwater and streamflow levels on water supply in real time. A strict interpretation of the District's water ban policy would cause the District to react to potential problems only once they had already occurred. In practice district staff are already incorporating indicators of hydrologic stress into their decisions regarding water bans over and above the written policy. This forward looking process should be made explicit by defining high, medium and low levels of hydrologic stress and using the hydrologic stress level in conjunction with average demand and safe yield to impose watering restrictions of appropriate severity.

To ensure equity between users of publicly and privately pumped water, and to greatly simplify the determination of who is and is not in compliance with the applicable water ban, we have proposed a program of essentially parallel use restrictions irrespective of the water source. Specifically we would recommend that mandatory odd-even type restrictions, which are generally intended to disperse peak demand during periods of modest hydrologic stress apply to only publicly pumped water users, but that mandatory total bans, handheld bans and the like which are generally designed to respond to genuine hydrologic stress be applied to all irrigators irrespective of the water source. Finally, we have proposed that private well irrigators be asked to follow lesser bans on a voluntary basis.

To streamline and unify the enforcement of the water bans we recommend enforcement be done through non-criminal ticketing, with identical penalties for private and public water users. We also recommend establishing a higher level of cooperation and mutual assistance among the Water District, Conservation Commission, Board of Health and Westwood Police in enforcement of both public and private water bans. Currently during

water bans, Water District staff conduct occasional patrols, issuing tickets and warnings as needed to their customers. At the same time, District staff could also note violations of private water bans and pass that information to either the Board of Health or Conservation Commission for further enforcement. At the same time, the Conservation Commission, Westwood Police and Board of Health have frequent occasion to observe violations of watering restrictions as they go about their daily duties. We would recommend that all of these agencies also make observations of such violations and report them to the appropriate agency for further follow up.

Ideally, we would recommend that the Water District retain ultimate authority for enforcement of water ban violations for users of the public system and that the Board of Health or Conservation Commission retain ultimate authority for enforcement of bans against private well users. However, we would also recommend that the Water District, Westwood Police, Conservation Commission and Board of Health all be “cross-deputized” to issue tickets for violations of either private or public water ban violations. Any disputes or appeals over a ticket issued by a “deputy” would then be referred back to the applicable ultimate authority for resolution.

While the Committee had many general discussions about the difficulties and complications of enforcement with limited staffing, they did not have the chance have a chance to explicitly discuss this idea. Nor did the project allow time for a full exploration of any legal issues that would be involved in such a mutual enforcement approach. However, we feel strongly that this integrated approach offers the best alternative for ensuring effective, efficient enforcement, with minimal duplication of effort among departments, while placing a minimal additional burden on any one department.

Additional Recommendations

Recommendation #9: Boards of Health throughout the Neponset River Watershed should adopt new private well regulations based on the Westwood model.

As part of the project we conducted a survey of private well regulations in other communities in the Neponset Valley. In general we found that almost all communities had regulations based on older model bylaws than those in place in Westwood. Most of the bylaws require no testing or permitting for private wells that will not be used for drinking water. An important first step to addressing the private well irrigation issue in most communities is to establish a more comprehensive set of basic regulations regarding private wells. Updated Board of Health private well bylaws could be adopted concurrently with the components of recommendation #10 to maximize efficiency.

Recommendation #10: Other communities in the Neponset Valley, particularly relatively affluent, low density communities, should adopt a framework of regulations similar to those recommended for Westwood above.

Recommendation #11: NepRWA and interested Neponset Valley communities should seek additional governmental and nongovernmental funding sources to prepare a set

of model zoning bylaws designed to minimize the need for landscape irrigation through better site design.

This is an important area that was not significantly addressed within the scope of this project.

Recommendation #11: All Neponset Valley communities should establish an annual budget of \$50,000 to \$100,000 for water conservation education and promotion activities, using water revenues.

To the best of our knowledge, the Dedham-Westwood Water District is the only local water supplier in the Neponset Valley that regularly sets aside more than a nominal amount of money to fund water conservation education and promotion. Throughout the Steering Committee's discussions, the practical limitations of enforcing any regulatory scheme were a prominent consideration. All members of the Steering Committee agreed that while regulatory approaches are important, it will ultimately be the ability of the community to educate its citizens about the need for action that will bring about desired outcomes. Establishing a budget for these activities is a prerequisite to success.

Recommendation #12: NepRWA and other interested agencies should seek funding to develop or find an inexpensive (or free), simple to use database that Boards of Health can use to more efficiently keep track of important information on private wells.

**Appendix A:
Existing Regulations Applicable to
Private Wells and Irrigation Systems in Westwood**

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Eighty-five

AN ACT ESTABLISHING THE DEDHAM-WESTWOOD WATER DISTRICT.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. The inhabitants of the towns of Dedham and Westwood liable to taxation in said towns and residing within the territory comprised within the territorial limits of said towns shall constitute a water district and are hereby made a body politic and corporate by the name of the Dedham-Westwood Water district, hereinafter called the district, for the purpose of supplying themselves with water for the extinguishment of fires and for domestic and other purposes, with power to lay water mains, to establish fountains and hydrants and to relocate and discontinue the same, to regulate the use of such water and to fix and collect rates to be paid therefor, and for the purposes of assessing and raising taxes as provided herein for the payment of such services, and for defraying the necessary expenses of carrying on the business of the district, with all the powers and privileges and subject to the limitations provided for in all general laws now or hereafter in force relating to such districts, except as otherwise provided herein. The district shall also have for its purpose the construction and financing of such water treatment works and facilities as may be necessary to deliver pure and healthful drinking water, including without limitation thereof, a proposed treatment plant for the White Lodge Well Field, and for this purpose, the district shall seek, obtain and accept any available capital and operating funds from the commonwealth or the Federal government or any authority or entity created by either of said governments. The district shall have power to prosecute and defend all actions relating to its property and affairs and shall be deemed a public employer for purposes of chapter two hundred and fifty-eight of the General Laws.

SECTION 2. For the aforesaid purposes the district, acting by and through its board of water commissioners hereinafter provided for:

(a) May contract with any municipality, acting through its water department, or with any water company, or with any water district, or with the Massachusetts Water Resources Authority for the purchase or sale of whatever water may be required, authority to furnish the same being hereby granted, and may enter into such other contracts as may be necessary to effectuate the purposes of this act;

(b) May, in addition to the powers granted to it by section ten, take by eminent domain under the provisions of chapter seventy-nine or chapter eighty A of the General Laws, or acquire, by lease, purchase or otherwise, and hold, the waters, or any portion thereof, of any pond, spring or stream, or of any ground sources of supply by means of driven, artesian or other wells, within the territorial limits of the towns of Dedham and Westwood not already appropriated for the purposes of a public water supply by another governmental body, and the water and flowage rights connected with any such water sources; may take as aforesaid, or acquire by purchase or otherwise, and hold, all lands, rights of way and other easements necessary for collecting, storing, holding, purifying and preserving the purity of the water and for conveying the same to any part of the district; provided, that no source of water supply or lands necessary for preserving the quality of such water shall be so taken or used without first obtaining the advice and approval of the department of environmental quality engineering, and that the location and arrangement of all dams, reservoirs, springs, wells, pumping, purification and filtration plants and such other works as may be necessary in carrying out the provisions of this act shall be subject to the approval of said department;

(c) May construct and maintain on the lands acquired and held under this act proper dams, wells, springs, reservoirs, standpipes, tanks, pumping plants, buildings, fixtures and other structures, including the establishment and maintenance of filter beds and purification works or systems, and may make excavations, procure and operate machinery and provide such other means and appliances, and do such other things as may be necessary for the establishment and maintenance of complete and effective water works; and for that purpose may construct pipe lines, wells and reservoirs, may establish pumping works, and may construct, lay, acquire and maintain aqueducts, conduits, pipes and other works under or over any land, water courses, railroads, railways, and public or other ways and along such ways, in said towns, in such manner as not unnecessarily to obstruct the same;

(d) May, for the purpose of constructing, laying, maintaining, operating and repairing such aqueducts, conduits, pipes and other works, and for all other purposes of this act, dig up or raise and embank any such lands, highways or other ways in such manner as to cause the least hindrance to public travel on such ways; provided, that the manner in which all things are done upon any such way shall be subject to the direction of the selectmen of the respective towns in which such lands, highways or other ways are located; and provided, further, that the district shall not enter upon, or construct or lay any conduit, pipe or other works within the location of any railroad corporation except at such time and in such manner as it may agree upon with such corporation or, in case of failure to so agree, as may be approved by the department of public utilities;

(e) May enter upon any lands for the purpose of making surveys, test wells or pits and borings, or any of them, and may take or otherwise acquire the right to occupy temporarily any lands necessary for the construction of any work or for any other purpose authorized by this act;

(f) May, pursuant to chapter three hundred and seventy-two of the acts of nineteen hundred and eighty-four, as may be amended from time to time, derive all or any part of its water supply from the Massachusetts Water Resources Authority;

(g) May from time to time sell such of the property of the district as shall, in the opinion of its board of water commissioners hereinafter provided for, be no longer useful in the conduct of the affairs of the district;

(h) May employ personnel and may engage architectural, engineering, accounting, management, legal, financial and environmental consulting and other professional services; and

(i) May do all things necessary, convenient or desirable for carrying out the purposes of this act or the powers expressly granted or necessarily implied by this act.

SECTION 3. Any person sustaining damages in his property by any taking under this act or any other thing done under authority thereof may recover such damages from the district under the provisions of said chapter seventy-nine or said chapter eighty A; but the right to damages for the nonexclusive taking of any water, water right or water source, or for any injury thereto, shall not vest until water is actually withdrawn or diverted under authority of this act.

SECTION 4. The district, for the purposes of paying the cost of, and expenses incurred in connection with, the taking or the acquisition of the properties of the Dedham Water Company as hereinafter provided, and for putting such properties in a satisfactory operating condition as may be in the district's opinion needed and as approved by the department of environmental quality engineering, may, from time to time, borrow such sums, as may be necessary, and may issue bonds or notes therefor, which shall be payable in not less than thirty years from their dates and shall bear on their face the words Dedham-Westwood Water District Water Loan, Act of 1985. Any bonds issued pursuant to the preceding sentence shall not be included in the amount of debt which is subject to limit prescribed by sections eight, nine and ten of chapter forty-four of the General Laws. The district, for the purpose of paying other necessary expenses and liabilities incurred under this act, other than expenses of maintenance and operation, may from time to time borrow such additional sums as may be necessary, not exceeding, in the aggregate, the amounts permitted by law to be borrowed by water districts, and may issue bonds or notes therefor which shall bear on their face the words Dedham-Westwood Water District Water Loan and such other distinguishing designation as may be determined by said board of water commissioners. The district may borrow from time to time such sums as may be necessary for the purposes of this act in anticipation of revenue. Indebtedness incurred under this act shall, except as otherwise provided herein, be subject to the provisions of said chapter forty-four pertaining to such districts. Each such borrowing and each such issue of bonds or notes shall constitute a separate loan, shall be authorized by the affirmative vote of not less than two-thirds of all the members of said board of water commissioners, and shall be upon the full faith and credit of the district. All bonds or notes issued under the provisions of this act shall be obligatory upon the district and its inhabitants and the property within the limits of the district according to the tenor and purport thereof.

SECTION 5. The district, acting by and through said board of water commissioners, shall, subject to the applicable provisions of law, fix just and equitable prices and rates for the use of water and shall prescribe the time and manner of payment. Notwithstanding the foregoing, such prices and rates shall be fixed and adjusted so as to provide funds at least sufficient in each fiscal year, together with other revenues and funds of the district, if any,

available therefor, to pay the full cost of operation of the district for that fiscal year, including all current expenses; all debt service on bonds or notes of the district; all costs of maintenance, repair and replacement, including the establishment of reasonable sinking funds, stabilization funds, replacement reserves and other similar funds in accordance with generally accepted accounting principals, as determined by the board of water commissioners to be necessary or desirable to be funded as current expenses; and all other amounts which the district may be obligated to pay or provide for by law or contract. Such prices and rates shall be reviewed on not less than an annual basis and as necessary shall be revised. In the event that the water system operated by the district shall have been taken by eminent domain, or otherwise acquired, from the Dedham Water Company, the district acting through said board of water commissioners, shall immediately after such taking or acquisition fix the rates to be paid within the territorial limits of the towns of Dedham and Westwood. If in any fiscal year a tax has been levied upon the inhabitants of the district under the provision of section six of this act, the board of water commissioners shall fix such prices and rates for the use of water as to raise within the shortest practicable period as determined by the board of water commissioners the amount of such tax and shall, at the end of each fiscal year thereafter until both towns of Dedham and Westwood shall have been reimbursed an amount equal to the amount of the taxes so paid to the district by the inhabitants of each town respectively, pay to each such town so much, if any, of the revenue of the district as is in excess of the cost of operation. Payments shall be made to each such town in the same proportions of such excess as those in which deficits were apportioned to each of such towns under the provisions of said section six. If there should be a net surplus remaining at the end of any fiscal year after the payment of all costs of operation and the aforesaid reimbursements, such net surplus shall be applied to pay costs of operation for the district for the succeeding fiscal year. The fiscal year of the district shall commence July first and end June thirtieth, or as otherwise provided in the bylaws of the district.

SECTION 6. If for any reason the revenues and available funds of the district, including revenues from prices and rates for the use of water as provided in section five hereof, shall be determined by the board of water commissioners not to be sufficient to pay the full cost of operation of the district, said board of water commissioners shall levy a tax upon the property of

the district, and promptly thereafter the clerk of the district shall apportion the amount of said tax between the property subject to tax under this act in the towns of Dedham and Westwood in proportion to the assessors' valuation of said property in each town and shall furnish a certified copy of the vote imposing said tax, together with said apportionment of the tax, to the assessors of said towns, who shall assess said tax on the property within the district in the same manner in all respects in which town taxes are required by law to be assessed. No estate shall be subject to any tax assessed on account of the system of water supply under this act, if, in the judgment of the board of water commissioners, after a hearing, due notice whereof shall have been given, such estate is so situated that it will receive no aid in the extinguishment of fire from said system of water supply, and if such estate is so situated that the buildings thereon, or the buildings that might be constructed thereon, could not be supplied with water from said system in any ordinary or reasonable manner; but all other estates in the district shall be deemed to be benefited and shall be subject to such tax. A certified list of the estates exempt from taxation under the provisions of this section shall be sent by said board of water commissioners to said assessors, at the same time at which the clerk shall send a certified copy of the vote as aforesaid. The assessments shall be committed to the respective town collectors, who shall collect said tax in the manner provided by law for the collection of town taxes, and shall deposit the proceeds thereof with the district treasurer for the use and benefit of the district. The district may collect interest on overdue taxes in the manner in which interest is authorized to be collected on town taxes, provided the board of water commissioners at the time of voting to levy the tax shall so determine and shall also fix a time when said tax is due.

SECTION 7. The management and control of all property acquired by, and the exercise of all the powers, privileges and duties conferred upon, the district pursuant to any of the provisions of this act shall be vested in and exercised by a board of water commissioners which shall be constituted as provided in section eight; provided, that no vote of the board of water commissioners authorizing the issue of bonds or notes under the provisions of section four, other than for temporary borrowings in anticipation of revenue, shall become effective before the expiration of twenty days from the date on which notice of such vote, stating the principal amount of the bonds or notes

to be issued and the purposes of such issue, shall have been published in a newspaper or newspapers of general circulation in the towns of Dedham and Westwood. If no petition as hereinafter provided for relative to any such vote is filed within said period of twenty days, such vote shall become effective upon the expiration of said period. If within said period a petition signed by registered voters of the towns of Dedham and Westwood at least equal in number to twenty per cent of the total number of such registered voters in the district shall be filed with the clerk of the district asking that the question of approving or disapproving such vote be submitted to the voters of the towns of Dedham and Westwood, such vote shall be further suspended from becoming effective and the board of water commissioners shall forthwith request the respective selectmen of the towns of Dedham and Westwood to call town meetings in their respective towns to act upon the question of approving or disapproving such order. The selectmen of the towns of Dedham and Westwood shall thereupon call town meetings of their respective towns for the purposes specified in such request. If a vote of the district submitted as aforesaid shall be approved by a majority of those voting at each of such town meetings, or shall be approved by a majority of those voting at one of such meetings and disapproved by less than two-thirds of those voting at the other one of such town meeting, such vote shall at once become effective, but not otherwise in case of such petition.

SECTION 8. The board of water commissioners provided for in section seven shall consist of six members, three of whom shall be inhabitants of and registered voters in the town of Dedham and three of whom shall be inhabitants of and registered voters in the town of Westwood. No such member shall hold any elective or appointive office, or be an employee of, either of said towns. Each board of selectmen of the towns of Dedham and Westwood, after both towns shall have accepted this act as hereinafter provided, shall appoint three inhabitants of and registered voters in their town to serve as members of the board of water commissioners, of whom one shall serve until January first, nineteen hundred and eighty-nine, one shall serve until January first, nineteen hundred and eighty-eight, and one shall serve until January first, nineteen hundred and eighty-seven, or until their successors are appointed and qualified. Beginning January first, nineteen hundred and eighty-seven and annually thereafter one inhabitant of and registered voter in each town shall be appointed by the board of selectmen of that town to serve as a member of

the board of water commissioners for the term of three years, or until a successor is appointed and qualified. Members of the board of water commissioners shall serve without pay but may be compensated for their actual expenses as approved by the board of water commissioners.

The district acting through its initial board of water commissioners shall promptly adopt bylaws describing by whom and how meetings of the board may be called, notified and conducted, establish rules and regulations for the management of its affairs not inconsistent with this act or any other provision of law, shall appoint, each for such term as it may determine, a clerk and a treasurer of the district, and such other officers and employees not specifically provided for in this act as it may deem necessary and proper and shall fix their compensation. The treasurer shall not be a member of the board of water commissioners and shall give bond to the district in such amount as may be approved by said board with a surety company authorized to transact business in the commonwealth as surety. At meetings of the board of water commissioners four members, of which two must be from the town of Dedham and two must be from the town of Westwood shall constitute a quorum. Any member of the board of water commissioners may be removed by the board of selectmen who appointed said member for misfeasance, malfeasance or wilful neglect of duty or other cause after notice and a public hearing unless such notice and hearing shall be expressly waived in writing. Vacancies occurring in the membership of the board of water commissioners from any cause may be filled for the remainder of the unexpired term by the board of selectmen entitled to appoint such member. No vacancy occurring in the membership of the board of water commissioners shall disqualify the board of water commissioners from taking any action authorized or permitted by this act.

In appointing officers and employees of the district, if it shall have taken by eminent domain or otherwise acquired the properties of the Dedham Water Company, the district, in its sole discretion, may give preferential recognition to the prior experience in the employment of employees of the Dedham Water Company at the time of said taking or acquisition.

The district shall annually prepare and provide to the board of selectmen of both of the towns of Dedham and Westwood and to each user of water in the district who requests the same a written report of the condition of the system, the actions of the board of water commissioners and the receipts and expenditures of the district for the preceding fiscal year. The district

shall furnish the selectmen of the towns of Dedham and Westwood with such other information as to the condition of the system, the actions of the board of water commissioners and the district and the receipts and expenditures of the district as may be reasonably requested by the selectmen of either of said towns, and such information shall be furnished within a reasonable time after receipt of such a request.

SECTION 9. Whoever wilfully or wantonly corrupts, pollutes or diverts any water obtained or supplied under this act, or wilfully or wantonly injures any reservoir, well, standpipe, aqueduct, pipe or other property owned or used by the district for any of the purposes of this act, shall forfeit and pay to the district three times the amount of damages assessed therefor, to be recovered in an action of tort, and upon conviction of any of the above wilful or wanton acts shall be punished by a fine of not more than three hundred dollars or by imprisonment for not more than one year, or both.

SECTION 10. The district, upon the acceptance of this act as hereinafter provided by the towns of Dedham and Westwood, is hereby authorized and empowered to purchase all the rights, franchises, privileges, and properties, tangible and intangible, real and personal, including furniture and equipment, inventories and material supplies, of the Dedham Water Company, at a price and upon such terms and conditions as may be agreed upon between the district and said corporation. In the event that the district shall elect to purchase such rights and properties, it shall give said corporation written notice of such intention, addressed to such corporation at its principal place of business, mailed by registered mail, postage prepaid. If at the expiration of sixty days after the date of such notice the district and said corporation shall have been unable to agree upon the price for such rights and properties, the district may take the same by eminent domain, or by purchase pursuant to the rights described below.

In addition to the right of the district to take or otherwise acquire the rights, franchises and properties of the Dedham Water Company as above provided, the district shall have the right, with the consent of said corporation and its stockholders, to purchase at a price to be agreed upon between the district and said corporation or its stockholders all the outstanding capital stock of said corporation for the sole purpose of dissolving and liquidating said corporation and immediately acquiring by transfer all its franchises, properties, rights, powers and privileges. Such purchase may, but need not

necessarily be, conditioned upon the stockholders paying any excess of the current liabilities over current assets, discharging its tax liability and assuming all other liabilities, fixed or contingent.

The district shall not acquire the assets or capital stock of the Dedham Water Company pursuant to an agreed purchase price until said price shall have been approved by majority votes adopted at town meetings of each of the towns of Dedham and Westwood.

Failing agreement on a price as set out in the first three paragraphs of this section, the district may purchase the corporate property, rights and privileges of the Dedham Water Company pursuant to any one or more of the rights granted to the towns of Dedham and Westwood by section ten of chapter one hundred and thirty-eight of the acts of eighteen hundred and seventy-six, as amended by chapter twelve of the acts of eighteen hundred and eighty-two, and by section five of Part I of chapter two hundred and forty-eight of the acts of nineteen hundred and thirty. The purchase price for the corporate property, rights and privileges of the Dedham Water Company pursuant to the foregoing statutes shall be determined by the department of public utilities, subject to acceptance of said determination by the supreme judicial court. Upon tender of said purchase price by the district, the Dedham Water Company shall deliver to the district good and sufficient conveyances of all of its right, title and interest in all of its corporate privileges, rights and property. The provisions of this section shall be enforceable in equity in the event of refusal by the Dedham Water Company of said tender immediately upon the deposit by the district of the tendered purchase price with the clerk of the superior court in the county of Norfolk. A justice of said superior court may thereafter convey all of the right, title and interest of the Dedham Water Company in all of its corporate property, rights and privileges to the district.

No rights granted to the district by this section shall be deemed to diminish or supersede the rights of the town of Dedham under section ten of chapter one hundred and thirty-eight of the acts of eighteen hundred and seventy-six, as amended by chapter twelve of the acts of eighteen hundred and eighty-two, or the rights of the town of Westwood under section five of Part I of chapter two hundred and forty-eight of the acts of nineteen hundred and thirty, except that upon acquisition of the assets of the Dedham Water Company by the district said rights shall terminate.

SECTION 11. The acceptance of this act by the towns of Dedham and Westwood shall constitute an acceptance by the district of sections forty-two A to forty-two I, inclusive, of chapter forty of the General Laws and promptly after the formation of the district the clerk shall file a certificate in the registry of deeds in the county of Norfolk signifying the acceptance by the district of sections forty-two A to forty-two F, inclusive, of said chapter forty.

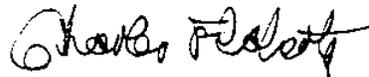
SECTION 12. This act shall be accepted by each town in the same manner as is provided by section four of chapter four of the General Laws for acceptance of statutes by towns; provided both towns shall have accepted this act within four years after its passage.

SECTION 13. The provisions of this act are severable, and if any provision hereof shall be held invalid in any circumstances, such invalidity shall not affect any other provisions or circumstances. This act shall be construed in all respects so as to meet all constitutional requirements. In carrying out the purposes and provisions of this act, all steps shall be taken that are necessary to meet constitutional requirements whether or not such steps are required by statute.

SECTION 14. This section and sections twelve and thirteen shall take effect upon their passage, and the remaining sections shall take effect upon acceptance of this act by both of the towns of Dedham and Westwood as provided in section twelve.

House of Representatives, July 18, 1985.

Passed to be enacted,



Acting
Speaker.

In Senate, July 18, 1985.

Passed to be enacted,

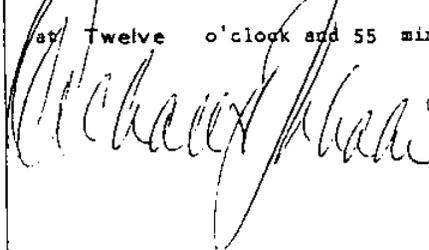


President.

July 24, 1985.

Approved,

at Twelve o'clock and 55 minutes, P. M.



Governor.

28. WATER CONSERVATION POLICY

Rules and Regulations

POLICY

Revised & Voted 06/27/00

The Commission will invoke Water Use Restrictions in accordance with Rule 28 – Water Conservation Plan in the District’s Rules & Regulations when total safe yield of all well fields are depleted to a point that the ratio between Estimated Safe Yield and the Weekly Average of System Delivery is below 125%. The Board of Water Commissioners, by majority vote, may change any of the following restrictions as circumstances require. The following stages will be enforced.

<u>Ratio</u>	<u>Stage</u>
125%-110%	I-A (Voluntary)
109%	I-B (Mandatory)
108%	II-A
107%	II-B
106%	II-C
105%	II-D
104% and less	III

Ratio* = Includes new well #5 (AN-1). If it appears that well #5 must be shut off due to low Neponset River levels, the remaining wells estimated safe yield shall be used.

Lifting of Regulations = To relax restrictions, the Ratio (estimated safe yield of the wells and/or purchases divided by the weekly average) must return to 110% for a seven day period and the future outlook, as determined by the District, is positive and shows continued improvement.

STAGE I-A Voluntary Odd / Even Outside Water Use Policy:

The public is requested to refrain voluntarily from watering lawns or other vegetation, washing vehicles, unnecessary washing down driveways and sidewalks, and other uses of water hoses, and to conserve water from effected public water supplies in all other practicable ways. Due publicity will be given to the need for water conservation and suggested methods of conservation will be published. Voluntary odd/ even outside water use policy.

STAGE I-B Mandatory Odd / Even Outside Water Use Policy:

Mandatory Odd / Even Outside Water Use Restrictions. To include watering lawns or other vegetation, washing vehicles, washing driveways or sidewalks, or any outside use. The District Water Commissioners may invoke monetary or other penalties for customers who violate any mandatory restriction order. The penalties for violating mandatory restrictions are as follows:

- First Violation: Warning
- Second Violation: \$100.00 fine
- Third & Additional Violations: \$250.00 and discontinuance of water service. A reactivation fee of \$250.00 will be charged before water service is restored.

STAGE II-A:

The purpose of Stage II-A is to reduce water consumption with minimum hardship or economic loss to individuals and business concerns. Use of the affected public water supply for any of the following purposes is prohibited:

1. Watering of shrubbery, trees, lawns, grass, plants or other vegetation except from a watering can or other container not exceeding three gallon capacity, excluding plant nurseries, golf course greens and commercial agricultural activities.
2. Washing of vehicles or other mobile equipment, except in vehicle wash facilities operating with water re-cycling system approved by the District with a prominently displayed sign in public view so stating, or except from a bucket or other container not exceeding three gallon capacity.
3. The washing of streets, driveways, parking lots, service station aprons, the exterior of commercial or residential buildings, or any other outdoor surface, except from a bucket or other container not exceeding three gallon capacity, unless such washing is required to eliminate a hazard.

4. Operation of any ornamental fountain or other structure making similar use of water.
5. Filling (from an empty or less than three quarters full condition) of swimming and/or wading pools, except for home wading pools requiring not more than five gallons of water.
6. Service of drinking water in restaurants, except on request.

STAGE II-B:

In addition to those measures included in Stage II-A, use of affected public water supply for any of the following purposes is preheated:

1. Adding water to any kind of outdoor swimming and/or wading pools, or to fountains, reflecting ponds or other ornamental structures.
2. Any other use of water supply for outdoor recreation.
3. Air conditioning, where interior temperature is less than 78 degrees Fahrenheit.

STAGE II-C:

In addition to those measures included in Stages II-A and B, the use of affected public water supply for any of the following purposes is prohibited:

1. Adding water to indoor swimming pools.
2. School athletic programs and other indoor athletic/recreation activities, including health spas.
3. Use of water from fire hydrants other than for health and safety purposes.
4. Use of water for construction purposes, including hydro-seeding, dust control and filling or flushing water mains for new development.
5. Commercial vehicle and automotive equipment washing.
6. Watering of golf course greens.

STAGE II-D:

In addition to those measures included in Stages II-A, B and C, use of affected public water supply for any of the following purposes is prohibited:

1. Make-up water for air conditioners.
2. Watering of plants by commercial nurseries and agricultural water users.
3. Use of automatic ice making machines in hotels and motels.
4. Production of bottling of beverages.
5. Operation of any commercial or industrial facility which is ordered closed by the local jurisdiction.

STAGE III:

In addition to those measures included in Stage II, the use of water for any purpose not essential to life, health and safety is prohibited. Specific guidelines for water use will be promulgated before invoking Stage III restriction.

Issued 12/17/86

GENERAL LAWS OF MASSACHUSETTS

PART I. ADMINISTRATION OF THE GOVERNMENT.

TITLE II. EXECUTIVE AND ADMINISTRATIVE OFFICERS OF THE COMMONWEALTH.

CHAPTER 21. DEPARTMENT OF ENVIRONMENTAL MANAGEMENT.

Chapter 21: Section 16. Persons engaged in business of digging or drilling wells; registration; reports.

Section 16. No person shall engage in the business of digging or drilling wells within the commonwealth unless he is registered with the division. Each person intending to engage in said business shall register annually with said division and upon payment of a fee determined annually by the commissioner of administration under the provision of section three B of chapter seven shall be issued a certificate indicating that he is so registered. Each registration shall be in force, unless sooner cancelled, suspended or revoked for violation of this section or any of the rules and regulations established under section eleven, until July first following the year of its issuance. Said registration shall be sufficient authority for any said person to engage in the business of digging or drilling wells anywhere within the commonwealth and no further licensing or registration shall be required; provided, however, that nothing contained herein shall prohibit the appropriate local authority in any city or town from requiring any person engaged in the digging or drilling of private wells to obtain a site permit in accordance with terms and conditions which ensure health and safety and said city or town may charge said person a reasonable fee for said site permit as determined by the city or town.

Within thirty days after completion of any well by digging or drilling, the person engaged in the business of digging or drilling wells shall submit a report to the division setting forth such information as may be required under said rules and regulations.

Whoever engages in the business of digging or drilling wells without being registered or fails to submit a report upon the completion of a well shall be punished by a fine of not more than three hundred dollars.

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ARTICLE 18.

Wetlands Protection Bylaw

SECTION 1. *Purpose.* The purpose of this Bylaw is to protect wetlands and adjoining land areas in the town of Westwood by controlling activities deemed by the Conservation Commission likely to have a significant or incremental effect upon wetland values, including but not limited to the following: public or private water supply, groundwater supply and quality, flood control, storm damage prevention, prevention of pollution, fisheries, wildlife habitat, and erosion and sedimentation control (collectively, the "wetland values protected by this Bylaw").

SECTION 2. *Jurisdiction.* Except as permitted by the Conservation Commission or as provided in this Bylaw, no person shall remove, fill, dredge, build upon, or alter the following resource areas: any freshwater wetland, marsh, wet meadow, bog, or swamp; any bank, lake, pond, vernal pond, river, or stream; any land under said waters; any land subject to flooding; or any riverfront area. Any activity proposed or undertaken within one hundred (100) feet of any freshwater wetland, marsh, wet meadow, bog, swamp, bank, lake, pond, vernal pond, river or stream (hereinafter called the Buffer Zone) which, in the judgment of the Commission will alter an area subject to protection under this Bylaw is subject to regulation under this Bylaw.

SECTION 3. *Exceptions.* The permit and application required by this Bylaw shall not be required by this Bylaw for maintaining, repairing, or replacing, but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public to provide electric, gas, water, sewer, telephone, telegraph, or other telecommunication services, provided that the structure or facility is not substantially changed or altered, provided that written notice has been given to the Commission prior to commencement of work, and provided that the work conforms to performance standards and design specifications in regulations adopted by the Commission and provided that the Commission issues written confirmation that such performance standards and design specifications are met by the work.

The permit and application required by this Bylaw shall not apply to emergency projects necessary for the protection of the health or safety of the public, provided that the work is to be performed by or has been ordered to be performed by an agency of the Commonwealth or a political subdivision thereof, provided that advance notice, oral or written, has been given to the Conservation Commission prior to commencement of work or within 24 hours after commencement, provided that the Commission or its agent certifies the work as an emergency project, provided that the work is performed only for the time and place certified by the Commission for the limited purposes necessary to abate the emergency, and provided that within 21 days of commencement of an emergency a permit application shall be filed with the Commission for review as provided in this Bylaw. Upon failure to meet these and other requirements of the Commission, the Commission may, after notice and a public hearing, revoke or modify an emergency project approval and order restoration and mitigation measures.

The presumption that activity undertaken within thirty-five (35) feet of certain resource areas shall alter those resource areas, as set out in Section 8(k) of this By-law, shall not apply to (a) any lot shown on a subdivision plan filed and approved by the Planning Board pursuant to General Laws chapter 41, sections 81P or 81S, for which application for Planning Board endorsement or approval has been made prior to March 1, 1998, to (b) any lot otherwise in existence as of March 1, 1998, or to (c) the repair, maintenance, alteration, reconstruction or expansion of any structure in existence as of March 1, 1998. Such land and structures shall be subject to the presumption that any activity undertaken within ten (10) feet of the boundary of a wetland, bank, pond, vernal pool, stream or river shall alter that resource area. The subdivision of any lot otherwise grandfathered pursuant to (a) or (b), above, shall be subject to the 35 foot setback presumption.

Other than stated in this section, the exceptions provided in the Wetlands Protection Act (G.L. c. 131, S. 40) shall not apply.

SECTION 4. Applications for Permits and Requests for Determination. Written application shall be filed with the Commission to perform activities regulated by this Bylaw affecting resource areas protected by this Bylaw. The application shall include such information and plans as are deemed necessary by the Commission to describe the proposed activities and their effects on the environment. No activities shall commence without receiving and complying with a permit issued pursuant to this Bylaw.

The Commission in an appropriate case may accept as the application and plans under this Bylaw the Notice of Intent and plans filed under the Wetlands Protection Act, G.L. c. 131, S. 40.

Any person desiring to know whether or not a proposed activity or an area is subject to this Bylaw may in writing request a determination from the Commission. Such a request for determination shall contain data and plans specified by the regulations of the Commission. The Commission in an appropriate case may accept as the application and plans under this Bylaw the Request for Determination and plans filed under the Wetlands Protection Act, G.L. c. 131, S. 40.

Any person filing an application for a permit or a request for determination shall do so with the Commission by certified mail, return receipt requested.

At the time of an application for a permit or request for determination the applicant shall pay a filing fee specified in regulations of the Commission. This fee is in addition to that required by the Wetlands Protection Act, G.L. c. 131, S. 40, and shall be commensurate with the costs incurred by the Commission.

To assist its review of permit applications, the Commission may engage scientific and environmental professionals to review applications for technical accuracy and compliance with this Bylaw, including delineation of wetland boundaries, identification and verification of wetland features, identification and assessment of wildlife habitat, and the review of hydrological data or calculations. The Commission is authorized to require the applicant to pay the costs and expenses of any expert consultant deemed necessary by the Commission to review the application. The Commission may waive the filing fee and costs and expenses for an application or request filed by a government agency and shall waive them for a request for determination filed by a person having no financial connection with the property which is the subject of the request.

SECTION 5. Notice and Hearings. Any person filing an Application for a Permit shall do so with the Commission by certified mail, return receipt requested, and such application shall also include a certified list of abutters within 300 feet, according to the most recent records of the Assessors, including those across a travelled way or a body of water. The Commission shall set the date and time for the Public Hearing for the Application, and provide to the Applicant a copy of a Public Hearing Notice which shall be published at the Applicant's expense in a newspaper of general circulation in the Town of Westwood at least five working days prior to the hearing date. Concurrently with newspaper advertisement, the Applicant shall post to each abutter by certified mail, return receipt requested, a copy of the Public Hearing Notice supplied to the Applicant by the Commission, and shall state where copies of the Application, including plans, may be examined and obtained by abutters free of charge. Applicants shall provide the Town Clerk with a complete copy of the Application and plans for public review.

Date of receipt of all filings made pursuant to this section shall be the date of the first regularly scheduled meeting of the Commission after certified mail receipt date.

The Commission shall commence the public hearing within 21 days of the date of receipt of an Application for a Permit. The return receipts from all abutters and/or proof of attempted delivery by certified mail shall be submitted the Commission at the opening of the Public Hearing.

The Commission shall issue its permit or decision to deny the permit within 21 days from the close of the public hearing.

The Commission shall have authority to continue the hearing to a specific date announced at the hearing, for reasons stated at the hearing, which may include receipt of additional information offered by the Applicant or others, information and plans required of the Applicant, reasons

deemed necessary by the Commission in its discretion. In the event the Applicant objects to a continuance or postponement, the hearing shall be closed and the Commission shall take action on such information as is available.

The Commission in an appropriate case may combine its hearing under this Bylaw with the hearing conducted under the Wetlands Protection Act, G.L. c. 131, S. 40.

Any person filing a Request for a Determination of Applicability shall do so by certified mail, return receipt requested. The Commission, upon receipt of same shall provide the person making the request with a copy of a Public Meeting Notice giving the date and time at which the request will be heard. The person making the request shall post, certified mail, return receipt requested, to the owner (if not the person making the request) and to each abutter, as defined above, a copy of the public meeting notice and shall state where complete copies of the Request, including plans, if any, may be inspected or obtained free of charge. Applicants shall provide the Town Clerk with a complete copy of the Request.

The Commission shall issue a Determination of Applicability within 21 days of receipt of the Request for Determination.

The Commission in an appropriate case may combine its meeting under this Bylaw with the meeting conducted under the Wetlands Protection Act, G.L. c. 131, S. 40.

SECTION 6. Permits, Determinations and Conditions. If the Commission after a public hearing determines that the activities which are the subject of the application are likely to have a significant or incremental effect upon the wetland values protected by this Bylaw, the Commission within 21 days of the close of the hearing shall issue or deny a permit for the activities requested. If it issues a permit, the Commission shall impose conditions which the Commission deems necessary or desirable to protect those values, and all activities shall be done in accordance with those conditions.

The Commission is empowered to deny a permit for failure to meet the requirements of this Bylaw; for failure to submit necessary information and plans requested by the Commission; for failure to meet the design specifications, performance standards, and other requirements in regulations of the Commission; for failure to avoid or prevent unacceptable significant or incremental effects upon the wetland values protected by this Bylaw; and where no conditions are adequate to protect those values. Due consideration shall be given to any demonstrated hardship on the applicant by reason of denial, as presented at the public hearing.

A permit shall expire three years from the date of issuance. Notwithstanding the above, the Commission in its discretion may issue a permit expiring five years from the date of issuance for recurring or continuous maintenance work, provided that annual notification of time and location of work is given to the Commission or for projects undertaken by a government agency. Any permit may be renewed once for an additional one year period, provided that a request for renewal is received in writing by the Commission prior to expiration.

For good cause the Commission may revoke or modify a permit issued under this Bylaw after public notice and public hearing, and notice to the holder of the permit.

The Commission in an appropriate case may combine the permit or other action on an application issued under this Bylaw with the Order of Conditions issued under the Wetlands Protection Act.

Prior to the commencement of any work permitted or required by a permit issued pursuant to this Bylaw, the permit shall be recorded by the Applicant in the Registry of Deeds or with the Registry of the Land Court, within the chain of title of the affected property. Certification of recording shall be sent to the Commission prior to the commencement of work. Failure to provide this certification prior to commencement shall be considered to be a violation of this Bylaw.

SECTION 7. Regulations. After public notice and public hearing the Commission shall promulgate rules and regulations to effectuate the purposes of this Bylaw. Failure by the Commission to promulgate such rules and regulations or a legal declaration of their invalidity by a court of law shall not act to suspend or invalidate the effect of this Bylaw. At a minimum these regulations

shall define key terms in this Bylaw not inconsistent with this Bylaw. Until such time as such regulations are promulgated, the regulations promulgated under the Wetlands Protection Act, G.L. c. 131, S. 40, shall be deemed to effectuate the purposes of this Bylaw.

SECTION 8. Definitions. The following definitions shall apply in the interpretation and implementation of this Bylaw.

The term "person" shall include any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the Commonwealth or political subdivision thereof to the extent subject to town bylaws, administrative agency, public or quasi-public corporation or body, this municipality, and any other legal entity, its legal representatives, agents, or assigns.

The term "Commission" shall mean the Conservation Commission as constituted under Article 5, Section 3, of the Town Charter.

The term "Wetlands Protection Act" shall mean Section 40 of Chapter 131 of the Massachusetts General Laws.

The term "freshwater wetland" shall mean any area, natural or manmade, in which groundwater is near, at, or above the surface of the soil for a significant portion of the growing season. Such areas have a hydrophytic vegetational community consisting of greater than fifty (50) percent wetland plant species, and have a saturated hydric soil. Wetland plant species are considered to be those species identified by the United States Fish and Wildlife Service as occurring primarily in wetlands, or those species identified as wetland species in scientific or technical reference publications.

The term "stream" shall mean any body of water which flows either throughout the year or intermittently, in a definite channel in the ground, whether natural or manmade. A portion of a stream may flow through a culvert. Such channel in the ground must be clearly visible on the surface of the substrate at such times when the channel is dry. Streams subject to protection under this Bylaw are those that flow within or out of a pond, lake, marsh, bog, swamp or wet meadow.

Riverfront Area — the area of land between a river's mean annual high water line measured horizontally outward from the river and a parallel line located 200 feet away, except that the parallel line is located: (i) 25 feet away in densely developed areas, as designated by the Conservation Commission, and (ii) 100 feet away for new agricultural and aquacultural activities.

River — a river is any natural flowing body of water that empties to any ocean, lake, pond, or other river and which flows throughout the year. Pertennial streams are rivers; intermittent streams are not rivers.

The term "land subject to flooding" shall mean any area adjacent to a water body which is inundated during the 100-year storm, as indicated on FEMA maps.

The term "pond" shall mean any body of water, either naturally occurring or manmade, which is never without standing water due to natural causes except during periods of extended drought. Swimming pools or other impervious manmade basins shall not be considered ponds.

The term "vernal pond" shall mean any naturally-occurring confined basin depression which holds water for a minimum of 2 continuous months during the spring and/or summer.

The term "alter" shall include, without limitation, the following activities when undertaken to, upon, within, or affecting resource areas protected by this Bylaw:

- (a) Removal, excavation, or dredging of soil, sand, gravel, or aggregate materials of any kind;
- (b) Changing of preexisting drainage characteristics, flushing characteristics, salinity distribution, sedimentation patterns, flow patterns, or flood retention characteristics;
- (c) Drainage or other disturbance of water level or water table;
- (d) Dumping, discharging, or filling with any material which may degrade water quality;
- (e) Placing of fill, or removal of material, which would alter elevation;
- (f) Driving of piles, erection or repair of buildings, or structures of any kind;
- (g) Placing of obstructions or objects in water;

- (h) Destruction of plant life including cutting of trees or brush;
- (i) Changing water temperature, biochemical oxygen demand, or other physical or chemical characteristics of water;
- (j) Any activities, changes or work which may cause or tend to contribute to pollution of any body of water or groundwater;
- (k) Any activity undertaken within thirty-five (35) feet of the boundary of a wetland, bank, pond, vernal pond, stream, or river shall be presumed to alter that resource area. This presumption may be overcome by demonstrating to the satisfaction of two-thirds of the Commission that the proposed activity will materially benefit the resource area.

Except as otherwise provided or required by this Bylaw or Regulations promulgated hereunder, definitions set forth in General Laws Chapter 131 section 40 and the regulations thereunder (310 C.M.R. 10.00, et seq.) shall apply to the construction of terms in this Bylaw.

SECTION 9. Security. As part of a permit issued under this Bylaw, in addition to any security required by any other municipal or state board, agency, or official, the Commission may require that the performance and observance of the conditions imposed hereunder be secured wholly or in part by one or more of the methods described below:

(a) By a proper bond or deposit of money or negotiable securities or other undertaking of financial responsibility equal in value to the cost of performance and observance of the conditions imposed to protect or restore the resource areas, as determined by the Commission;

(b) By a conservation restriction, easement, or other covenant enforceable in a court of law, executed and duly recorded by the owner of record, running with the land to the benefit of this municipality whereby the permit conditions shall be performed and observed before any lot may be conveyed other than by mortgage deed.

SECTION 10. Enforcement. The Commission, its agents, officers, and employees shall have authority to enter upon privately owned land for the purpose of performing their duties under this Bylaw and may make or cause to be made such examinations, surveys, or sampling as the Commission deems necessary.

The Commission shall have authority to enforce this Bylaw, its regulations, and permits issued thereunder by violation notices, administrative orders, and civil and criminal court actions.

Upon request of the Commission, the Board of Selectmen and the Town Counsel shall take legal action for enforcement under civil law. Upon request of the Commission the Chief of Police shall take legal action for enforcement under criminal law.

Municipal boards and officers, including any police officer having police powers shall have authority to assist the Commission in enforcement.

Any person who violates any provision of this Bylaw, regulations thereunder, or permits issued thereunder, shall be punished by a fine of not more than \$300.00. Each day or portion thereof during which a violation continues shall constitute a separate offense, and each provision of the Bylaw, regulations, or permit violated shall constitute a separate offense.

In the alternative to criminal prosecution the Commission may elect to utilize the non-criminal disposition procedure set forth in General Laws Chapter 40, Section 21D.

SECTION 11. Preacquisition Violations. Any person who purchases, inherits, or otherwise acquires real estate upon which work has been done in violation of the provisions of this chapter or in violation of any permit issued pursuant to this Bylaw shall forthwith comply with any such order or restore such land to its condition prior to any such violation; provided, however, that no action, civil or criminal, shall be brought against any such person unless commenced within three (3) years following the date of acquisition of the real estate by such person or five (5) years after the violation, whichever is earlier.

SECTION 12. *Burden of Proof.* The applicant for a permit shall have the burden of proving by a preponderance of the credible evidence that the work proposed in the application will not have unacceptable significant or incremental effect upon the wetland values protected by this Bylaw. Failure to provide adequate evidence to the Commission supporting this burden shall be sufficient cause for the Commission to deny a permit or grant a permit with conditions.

SECTION 13. *Rights of Appeal.* Any person aggrieved by the decision of the Commission, whether or not previously a party to the proceeding, may file a complaint seeking relief in the Superior Court of the County of Norfolk, according to the provisions of Massachusetts General Laws, not more than 21 days after the issuance of the decision of the Commission. Such a complaint may also be filed if the Commission fails to hold a public hearing or issue an Order, Notification, or Determination within the time period required by this Bylaw.

SECTION 14. *Relation to the Wetlands Protection Act.* This Bylaw is adopted under the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Statutes, independent of the Wetlands Protection Act, G.L. c. 131, S. 40, and regulations thereunder.

SECTION 15. *Severability.* The invalidity of any section or provision of this Bylaw shall not invalidate any other section or provision thereof, nor shall it invalidate any permit or determination which previously has been issued.

Article 18

Adopted at 1989 Annual Town Meeting (Article 10).

*Section 8K was deleted in its entirety and a new Section 8K substituted therefor
1998 Annual Town Meeting (Article 27).*

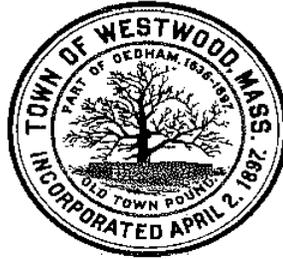
Section 3, Paragraph 3, added at 1998 Annual Town Meeting (Article 27).

*Section 2 was deleted in its entirety and a new Section 2 substituted therefor
1998 Annual Town Meeting (Article 28).*

*Section 8 was amended by adding definitions of Riverfront area and River
1998 Annual Town Meeting (Article 28).*

*Section 3, Paragraph 3, was amended by extending the M.G.L. citations in line 4 to 81S.
Amended at 2000 Annual Town Meeting (Article 28).*

Town of Westwood
Commonwealth of Massachusetts



WESTWOOD BOARD OF HEALTH
PRIVATE WELL REGULATIONS

r

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I. PURPOSE

These regulations are intended to protect the public health and general welfare of the residents of the Town of Westwood by ensuring that private wells producing water for human consumption and irrigation purposes are constructed in a manner, which will protect the quality of the water obtained from these private wells.

II. AUTHORITY

The Westwood Board of Health adopts these regulations, as authorized by Massachusetts General Laws Chapter 111, Section 31. These regulations supersede all previous regulations adopted by the Board of Health relative to the construction of private wells.

III. DEFINITIONS

Agent: Any person designated and authorized by the Board to execute these regulations. The agent shall have all the authority of the appointing Board and shall be directly responsible to the Board and under its direction and control.

Applicant: Any person who intends to have a private well constructed or altered.

Aquifer: A water bearing geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Bedroom: A room providing privacy, intended primarily for sleeping with all of the following attributes:

- A) floor space of no less than 70 square feet;
- B) for new construction, a ceiling height of no less than 7'3";
- C) for existing houses and for mobile homes, a ceiling height of no less than 7'0";
- D) an electrical service and ventilation; and,
- E) at least one window.

Living rooms, dining rooms, kitchens, halls, bathrooms, unfinished cellars and unheated storage areas over garages are not considered bedrooms. Single family dwellings shall be presumed to have at least three bedrooms.

Board: The Board of Health of Westwood Massachusetts or its authorized agent.

Casing: Impervious durable pipe, placed in a boring to prevent the walls from caving in and to serve as a vertical conduit for water in a well.

Certified Laboratory: Any laboratory certified or provisionally certified by the Department of Environmental Protection for testing drinking water.

Dug Well: A private well that is excavated but not drilled.

Maximum Contaminant Level (MCL): The highest level allowed of any physical, chemical, biological, or radiological substance or matter in water as defined as drinking water standards by the U.S. Environmental Protection Agency or the State of Massachusetts.

Person: An individual, corporation, company, association, trust, or partnership.

Private Well: Any driven, or drilled hole, with a depth greater than its largest surface diameter developed to supply water intended or used for human consumption and/or irrigation not subject to regulation 310 CMR 22.00.

Pumping Test: A procedure used to determine the characteristics of a well and adjacent aquifer by installing and operating a pump.

Registered Well Driller: Any person registered with the Department of Environmental Management/Office of Water Resources to dig or drill wells in the Commonwealth of Massachusetts.

Shallow Well: A private well not more than 100 feet deep.

Static Water Level: The level of water in a well under non-pumping conditions.

Structure: A combination of materials assembled at a fixed location to give support or shelter, such as a building, framework, retaining wall, fence, or the like.

IV. WELL CONSTRUCTION PERMIT

The property owner or his designated representative shall obtain a permit from the Board of Health prior to the commencement of construction of a private well. Each permit application to construct a well shall include the following:

1. The property owner's name and address;
2. The well driller's name and proof of valid state registration;
3. A plan with a suitable scale, (one inch = forty (40) feet or fewer.); signed and stamped by a registered land surveyor or professional civil engineer, showing the location of the proposed well in relation to existing or proposed structures above or below ground;
4. A description of prior and current land uses within two hundred (200) feet of the proposed well location, which represent a potential source of contamination, including but not limited to the following:
 - a) existing and proposed structures;
 - b) subsurface sewage disposal systems;
 - c) subsurface fuel storage tanks;
 - d) public ways;
 - e) utility rights-of-way;

- f) any other potential sources of pollution;
5. Documentation that the applicant has notified the abutting property owners by certified mail of his/her intention to install a well.
6. A permit fee of One Hundred Dollars (\$100.00).

The permit shall be on site at all times that work is taking place. Each permit shall expire one (1) year from the date of issuance unless revoked for cause. Permits may be extended for one additional six (6) month period provided that a written request is received by the Board prior to the one-year expiration date. No additional fee shall be charged for a permit extension provided there is no change in the plans for the proposed well.

Well Construction Permits are not transferable.

V. WELL LOCATION AND USE REQUIREMENTS

In locating a well, the applicant shall identify all potential sources of contamination, which exist, or are proposed, within two hundred (200) feet of the site. When possible, the well shall be located upgradient of all potential sources of contamination and shall be as far removed from potential sources of contamination as possible, given the lay-out of the premises.

Each private well shall be accessible for repair, maintenance, testing, and inspection. The well shall be completed in a water bearing formation that will produce the required quantity of water under normal operating conditions. Dug and shallow wells shall be prohibited.

Private wells shall be prohibited from the Aquifer Protection District boundaries as delineated in Section 12B of the Westwood Zoning Bylaw.

Each private well shall be located at least ten (10) feet from any property line. The centerline of a well shall, if extended vertically clear any projection from an adjacent structure by at least five (5) feet.

All private wells shall be located a minimum of twenty-five (25) feet from the normal driving surface of any public roadway or a minimum of fifteen (15) feet from the road right-of-way, whichever is greater.

Each private well shall be located at least twenty-five (25) feet, laterally, from the normal high water mark of any lake, pond, river, stream, ditch, or slough. When possible, private water systems shall be located in areas above the 100-year floodplain.

A suction line or well shall be located a minimum of ten (10) feet from a building sewer constructed of durable corrosion-resistant material with watertight joints, or fifty (50) feet from a building sewer constructed of any other type of pipe; fifty (50) feet from a septic

tank; one hundred (100) feet from a leaching field; and one hundred (100) feet from a cesspool or privy.

Water supply lines shall be installed at least ten (10) feet from and 18 inches above any sewer line. Whenever sewer lines must cross over water supply lines, both pipes shall be constructed of class 150-pressure pipe and shall be pressure tested to assure watertightness.

The Board reserves the right to impose minimum lateral distance requirements from other potential sources of contamination not listed above. All such special well location requirements shall be listed, in writing, as a condition of the well construction permit.

No private well, or its associated distribution system, shall be connected to either the distribution system of a public water supply system or any type of waste distribution system.

VI. WATER QUANTITY REQUIREMENTS

The applicant shall submit to the Board for review and approval a Pumping Test Report. The Pumping Test Report shall include the name and address of the well owner, well location referenced to at least two permanent structures or landmarks, date the pumping test was performed, depth at which the pump was set for the test, location for the discharge line, the static water level immediately before pumping commenced, discharge rate and, if applicable, the time the discharge rate changed, pumping water levels and respective times after pumping commenced, maximum draw down during the test, duration of the test, including both the pumping time and recovery time during which measurements were taken, recovery water levels and respective times after cessation of pumping, and the reference point used for all measurements.

Pressure tanks for individual home installations shall have a minimum capacity of 42 gallons.

Auxiliary power must be available to maintain a water supply for multiple dwellings.

In order to demonstrate the capacity of the well to provide the required volume of water, a pumping test shall be conducted in the following manner.

- 1) The volume of water necessary to support the household's daily need shall be determined using the following equation: (number of bedrooms plus one bedroom) x (110 gallons per bedroom) x (a safety factor of 2) = number of gallons needed daily.
- 2) The storage capacity of the well shall be determined using the measured static water level and the depth and radius of the drillhole or casing.
- 3) The Required Volume shall be calculated by adding the volumes of water

in (1) and (2) above. It is this volume of water that must be pumped from the well within a 24-hour period.

The pumping test may be performed at whatever rate is desired. Following the pumping test, the water level must be shown to recover to within eighty-five (85) percent of the pre-pumped static water level within a twenty-four (24) hour period.

Example 1: A one bedroom house with a well six (6) inches in diameter and contains 200 ft. of standing water:

- A. *1 bedroom + 1 bedroom = (2 bedrooms) x (110 gallons per bedroom) x (safety factor of 2) = 440 gallons.*
- B. *The volume of a 6-inch well is 1.5 gallons for every foot of water column length. Therefore, (200 ft of standing water) x (1.5 gallons/ft) = 300 gallons.*
- C. *440 gallons + 300 gallons = **740 gallons** that must be pumped from the well in 24 hours or less to demonstrate suitable capacity. Recovery up to 85% of the static water level must also occur within 24 hours after cessation of pumping*

Example 2: For a 4 bedroom house with a well that is six (6) inches in diameter and contains 100 ft. of standing water:

- A. *4 bedrooms + 1 bedroom = (5 bedrooms) x (110 gallons per bedroom) x (safety factor of 2) = 1,100 gallons needed daily.*
- B. *The volume of a 6 inch well is 1.5 gallons for every foot of water column length. Therefore, (100 ft. of standing water) x (1.5 gallons/ft.) = 150 gallons.*
- C. *1,100 gallons + 150 gallons = **1250 gallons** that must be pumped from the well in 24 hours or less to demonstrate suitable capacity. Recovery up to 85% of the static water level must also occur within 24 hours after cessation of pumping.*

VII. WATER QUALITY TESTING REQUIREMENTS

After the well has been completed and disinfected, and prior to using it as a drinking water supply or for irrigation, a water quality test shall be conducted.

A water sample shall be collected either after purging three well volumes or following the stabilization of the pH, temperature and specific conductance in the pumped well. The water sample to be tested shall be collected at the pump discharge or from a disinfected tap in the pump discharge line. In no event shall a water treatment device be installed prior to sampling.

The water quality test, utilizing an applicable US EPA approved method for drinking water testing, shall be conducted by an EPA or Massachusetts certified laboratory and

shall include analysis for the following parameters and the results shall not exceed Massachusetts drinking water standards for public water supplies, including Massachusetts primary and secondary standards:

Volatile Organic Compounds *MCL (mg/l) Volatile Organic Compounds *MCL (mg/l)

Benzene	0.005	Monochlorobenzene	0.1
Carbon Tetrachloride	0.005	Styrene	0.1
Dichloromethane	0.005	Tetrachloroethylene	0.005
o-Dichlorobenzene	0.6	Toluene	1
para-Dichlorobenzene	0.005	Trichloroethylene	0.005
1,2-Dichloroethane	0.005	1,1,1-Trichloroethane	0.2
cis-1,2-Dichloroethylene	0.07	1,2,4-Trichlorobenzene	0.07
trans-1,2-Dichloroethylene	0.1	1,1,2-Trichloroethane	0.005
1,1-Dichloroethylene	0.007	Vinyl Chloride	0.002
1,2-Dichloropropane	0.005	Xylenes (total)	10
Ethylbenzene	0.7		

Radionuclides *MCL Coliform Bacteria *MCL

Gross Alpha Activity	15 pCi/l	Coliform Bacteria	0
Radon	10,000 pCi/l		
If Gross Alpha Activity exceeds 15 pCi/l, then test the following			
Radium-226 & 228	5 pCi/l		
Uranium	20 ug/l		

Inorganic Compounds *MCL (mg/l) Massachusetts Secondary Standards *MCL (mg/l)

Antimony	0.006	Aluminum	0.05 to 0.2
Arsenic	0.01	Chloride	250
Barium	2	Color	15 color units
Beryllium	0.004	Copper	1
Cadmium	0.005	Fluoride	2
Chromium (total)	0.1	Foaming Agents	0.5
Cyanide	0.2	Iron	0.3
Thallium	0.002	Manganese	0.05
Lead (action level)	0.015	Odor	3 threshold unit numbers
Copper (action level)	1.3	pH	6.5-8.5
Mercury	0.002	Silver	0.10
Nitrate (N)	10	Sulfate	250
Nitrite (N)	1	Total Dissolved Solids (TDS)	500
Total Nitrate & Nitrite (N)	10	Zinc	5
Selenium	0.05		

***Maximum Contaminant Levels (MCL)** are updated periodically. The water quality of the private well must meet the most up-to-date standard as promulgated by the Department of Environmental Protection (DEP).

Irrigation wells must be tested for coliform bacteria and the Massachusetts Secondary Standards.

Following a receipt of the water quality test results, the applicants shall submit a Water Quality Report to the Board, which includes:

- 1) a copy of the certified laboratory's test results
- 2) the name of the individual who performed the sampling
- 3) where in the system the water sample was obtained

The Board reserves to right to require re-testing of the above parameters, or testing for additional parameters when, in the opinion of the Board, it is necessary due to local conditions for the protection of the public health, safety and welfare. All costs and laboratory arrangements for the water testing are the responsibility of the applicant.

In areas where current or historical aldrin use includes agriculture, the Board may require testing for pesticides and herbicides.

The Board shall require that a water quality test be conducted before the property on which the well is located changes ownership and a copy of the results shall be forwarded to the Board of Health.

VIII. WATER SUPPLY CERTIFICATE

A Water Supply Certificate must be issued for the use of a private well prior to the issuance of an occupancy permit for an existing structure, or prior to the issuance of a building permit for new construction which is to be served by the well.

The following shall be submitted to the Board of Health to obtain a Water Supply Certificate:

- 1) A well construction permit;
- 2) A copy of the Water Well Completion Report as required by the Department of Environmental Management, Office of Water Resources (*313 CMR 3.00*);
- 3) A copy of the Pumping Test Report required pursuant to Section VII of these regulations; and
- 4) A copy of the Water Quality Report required pursuant to Section VIII of these regulations.

Upon receipt and review of the above documents, the Board shall make a final decision on the application for a Water Supply Certificate. A final decision shall be in writing and shall comprise of one of the following actions:

- 1) Issue a Water Supply Certificate;
- 2) Issue a conditional Water Supply Certificate, which will specify the conditions, which the Board deems necessary to ensure fitness, purity and quantity of the water, derived from that private well. Said condition(s) may

include but not be limited to requiring treatment or additional testing of the water; or

- 3) Deny the applicant a Water Supply Certificate and specify the reason for the denial.

IX. WELL CONSTRUCTION REQUIREMENTS

Pursuant to *313 CMR 3.00*, no person in the business of digging or drilling shall construct a well unless registered with the Department of Environmental Management/Office of Water Resources.

Any work involving the connection of the private well to the distribution system of the residence must conform to the local plumbing code. All electrical connections between the well and the pump controls and all piping between the well and the storage and/or pressure tank in the house must be made by a pump installer or registered well driller, including the installation of the pump and appurtenance in the well or house.

Electrical service grounds shall not be attached to the water piping. All electrical service and controls of wells must be permitted, inspected and approved according to Town and State Regulations.

A physical connection is not permitted between a water supply, which satisfies the requirements of these regulations, and another water supply that does not meet the requirements of these regulations without prior approval of the Board.

A. General Well Design and Construction

All private water supply wells shall be designed such that:

- 1) the materials used for the permanent construction are durable in the specific hydrogeologic environment that occurs at the well site.
- 2) no unsealed opening will be left around the well that could conduct surface water or contaminated groundwater vertically to the intake portion of the well or transfer water from one formation to another.

Permanent construction materials shall not impart toxic substance taste, odors, or bacterial contamination to the water in the well.

The driller shall operate all equipment according to generally accepted standards in the industry and shall take appropriate precautions to prevent damage, injury or other loss to persons and property at the drilling site.

Well construction design shall insure that surface water does not enter the well through the opening or seepage through the ground surface. Construction site waste and materials shall be disposed of in such a way as to avoid contamination of the well and the aquifer. During anytime that the well is unattended, the contractor shall secure the well in a way

as to prevent either tampering with the well or the introduction of foreign material into the well.

Well yield shall be measured and recorded at least every fifty (50) feet during drilling.

All water used for drilling, well development, or to mix a drilling fluid shall be obtained from a source, which will not result in contamination of the well or the water bearing zones penetrated by the well. Water shall be conveyed in clear sanitary containers or water lines and shall be chlorinated to an initial concentration between 50 mg/l and 100 mg/l

The installation of the pipes shall be done in such a manner that they are protected from crushing, freezing and/or attack by rodents.

A free-chlorine residual of 10 mg/l shall be maintained in any water used at the drill site. Water from wetlands, swamps, ponds and other similar surface features shall not be used.

All drilling equipment, including pumps and down-hole tools, shall be cleaned and disinfected prior to drilling each new well or test hole.

All drilling fluids shall be nontoxic. Drilling fluid additives shall be stored in clean containers and shall be free of material that may adversely affect the well, the aquifer, or the quality of the water to be pumped from the well. Surfactants should be biodegradable. The use of biodegradable organic polymers shall, when possible, be avoided.

All wells, including those that have been hydrofractured, shall be developed in order to remove fine materials introduced into the pore spaces or fractures during construction. One or more of the following methods shall be used for development: overpumping, backwashing, surging, jetting, and/or airlift pumping.

The completed well shall be sufficiently straight so that there will be no interference with installation, alignment, operation or future removal of the permanent well pump.

B. Well Casing

Private water supply wells shall be constructed using either steel or thermoplastic well casing. The casing shall be of adequate strength and durability to withstand anticipated formation and hydrostatic pressures, the forces imposed on it during installation, and the corrosive effects of the local hydrogeologic environment.

Steel casing shall be used with cable tool drilling or when the casing is installed in an open drillhole in which formation materials may suddenly collapse against the casing.

All casing used in the construction of private water supply wells shall be free of pits, breaks, gouges, deep scratches and other defects. If previously used casing is installed, it shall be decontaminated and disinfected prior to installation.

Installation of well casing shall be done in a manner that does not alter the shape, size, or strength of the casing and does not damage any of the joints or couplings connecting sections of the casing. A standard drive shoe shall be used when casing is installed. The driveshoe shall be either welded or threaded to the lower end of the string of casing and shall have a beveled metal cutting edge forged, cast, or fabricated for this specific purpose.

Upon completion of the installation procedure, the entire length of the casing above the intake shall be watertight.

For wells completed above grade, the casing shall extend at least 12 inches above the finished grade. For wells constructed in a floodplain, the casing shall extend at least two feet above the level of the highest recorded flood. The top of the casing shall be reasonably smooth and level.

A pitless adapter shall be provided such that the permanent water-tight casing of the well shall terminate a minimum of 12 inches above finished grade.

1. Steel Casing

Steel casing shall consist of schedule 40 pipe that complies with material standards approved by the American Water Works Association.

Segments of steel casing shall be coupled by using threaded casing, coupling, or by welding the joint. Recessed or reamed and drifted couplings shall be used on threaded casing and no threads shall be left exposed once the joint is completed. When welding casing joints are used, they shall conform to the most recent revision of AWWA C206, "Standard for Field Welding of Steel Water Pipe." The weld shall be at least as thick as the wall thickness of the well casing and shall be fully penetrating. When completed, a welded casing joint shall have a tensile strength equal to or greater than that of the casing.

2. Thermoplastic Casing

Thermoplastic casing used in the construction of private water supply wells shall be capable of withstanding pressures equal to or greater than 200 pounds per square inch and shall conform to the most recent revision of ASTM Standard F480, "Specification for Thermoplastic Water Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR)." In addition, the casing and couplings shall meet the requirements of the most recent revision of National Sanitation Foundation Standard Number 14, entitled "Plastics Piping System Components and Related Materials." Materials complying with Standard Number 14 can be recognized by the marking "NSF-WC."

Thermoplastic casing shall be stored in such a manner as to prevent deformation, sagging, or bending. Storage of thermoplastic casing and couplings in direct sunlight shall be avoided. Thermoplastic casing shall be installed only in an oversized drillhole and shall not be driven, pushed, or forced into a formation. Thermoplastic casing shall be joined by mechanical means only. When pulling back thermoplastic well casing to expose a well screen, the force applied shall not exceed the casing weight.

C. Well Screen

A well screen is necessary for all drilled wells that are completed in unconsolidated formations. Wells completed in bedrock do not require a screen unless the bedrock formation is brittle in nature or has a potential for collapse. The well screen aperture openings, screen length, and diameter shall be selected so as not to limit the aquifers' water yielding characteristics while preventing access of soil particles that would detract from well efficiency and yield.

D. Grouting and Sealing

Private wells drilled in bedrock shall be grouted from the top of the weathered rock interface to fifteen (15) feet into competent bedrock. Either neat cement grout or sand cement grout shall be used and it shall be emplaced using standard grouting techniques as described in the DEP Private Well Guidelines.

All wells completed with the casing extending above grade shall have a surface seal designed to eliminate the possibility of surface water flowing down the annular space between the well casing and the surrounding backfilled materials. The surface seal shall extend to a depth below the local frost line.

E. Pumps and Pumping Equipment

All pumps shall be installed either below the frost line with a pitless adapter or in some other heated and protected sanitary location.

Deep-well reciprocating pumps shall be installed directly over the well. Submersible and helical rotor pumps must be installed in the well. A deep-well jet may be offset from the well.

F. Wellhead Completion

Well casing shall not be cut off below the land surface unless a pitless adapter or a pitless unit is installed or an abandoned well is being permanently plugged. Well casing terminating above-grade shall extend at least 12 inches above the predetermined ground surface at the wellhead except when the well is located in a floodplain. When a well is located in a floodplain, the well casing shall extend at least 2 feet above the level of the highest recorded flood. The top of the well casing shall be reasonably smooth and level.

Any well that does not terminate at the ground surface in the base of a pump shall be equipped with a sanitary seal or watertight cap designed to prevent surface water and foreign matter from entering the well. A flowing artesian well shall be equipped with a shut-off valve and backflow preventer so that the flow of water can be stopped completely when the well is not in use.

All wells except flowing artesian wells shall be vented. The opening of the vent pipe shall be covered with a 24 mesh corrosion resistant screen and shall be large enough to prevent water from being drawn into the well through electrical conduits or leaks in the seal around the pump when the pump is turned on. The vent pipe shall terminate in a downward position at or above the top of the casing.

All connections to a well casing made below ground shall be protected by either a pitless adapter or a pitless unit that complies with the most recent revision of National Sanitation Foundation Standard Number 56, entitled "Pitless Well Adapters."

Above grade connections into the top or side of a well casing shall be at least 12 inches above the established ground surface or two feet above the level of the highest known flood, whichever is higher. Above ground connections shall be sealed so that they are watertight.

The ground material immediately surrounding the well casing shall be sloped downward and away from the well in all directions to eliminate the possibility of surface water ponding.

G. Disinfection

Upon completion of well construction, the well contractor shall disinfect the well. If a pump is to be installed by the well contractor immediately upon completion of the well, the contractor shall disinfect the well and the pumping equipment after the pump has been installed.

If the pump is not installed upon completion of the well, the pump contractor shall, upon installation, disinfect the well and the pumping equipment. The pump contractor shall also disinfect the entire water supply system after any maintenance or repair work is done on the pump.

When the well is disinfected, the initial chlorine concentration shall be 100 mg/l throughout the entire water column.

For newly constructed or altered wells in which the pump is not immediately installed, the chlorine concentration used to disinfect the well shall be 100 mg/l. Upon installation of the pump, disinfection of the well, the pumping equipment and the distribution system, if connected, shall be accomplished with a chlorine concentration of 100 mg/l.

The disinfectant solution shall remain, undisturbed, in the well for a minimum of two (2) hours. After all the chlorine has been flushed from the water supply system, a water sample shall be collected and submitted to a state certified laboratory. For new wells, the sample shall be tested pursuant to Section VI of these regulations. For wells, which have undergone repair, the sample shall be tested for coliform bacteria and any other parameters deemed appropriate by the Board.

X. DECOMMISSIONING REQUIREMENTS

Abandoned wells, test holes, and borings shall be decommissioned so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water.

The owner of a private well shall decommission the well if the well meets any of the following criteria:

- 1) Construction of the well is terminated prior to completion of the well.
- 2) The well owner notifies the Board that the use of the well is to be permanently discontinued.
- 3) The well has been out of service for at least three years.
- 4) The well is a potential hazard to public health or safety and the situation cannot be corrected.
- 5) The well is in such a state of disrepair that its continued use is impractical.
- 6) The well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.

The property owner shall be responsible for ensuring that all abandoned wells and test holes or borings associated with private well installation are properly plugged. Only registered well drillers may plug abandoned wells, test holes, and borings.

In the case of existing shallow or dug wells, abandonment shall require the well be filled with clean fill.

In the case of new well construction, all test holes and borings shall be plugged before the well driller completes work at the site.

Abandoned wells or borings shall be completely filled with a neat cement grout, sand cement grout, concrete, or bentonite grout.

Regardless of the type used, the grout:

- 1) shall be sufficiently fluid so that it can be applied through a tremie pipe from the bottom of the well upward;
- 2) shall remain as a homogeneous fluid when applied to the subsurface rather than disaggregating by gravity into a two phase substance;
- 3) shall be resistant to chemical or physical deterioration; and,

- 4) shall not leach chemicals, either organic or inorganic, that will adversely affect the quality of the groundwater where it is applied.

The plugging materials shall be introduced at the bottom of the well or boring and placed progressively upward to a level approximately four (4) feet below the ground surface. Sealing materials shall never be poured from the land surface into the well, borehole, or annular space being sealed.

The contractor shall emplace the surface seal no sooner than 24 hours after the well or boring has been plugged. Before the surface seal is placed, casing remaining in the hole shall be cut off. The remaining four feet at the top of the well or boring shall then be filled with concrete. The top of the seal shall comprise a concrete slab above the top of the plugged well or boring. This concrete slab shall be at least six (6) inches thick and shall be at least two (2) feet greater in diameter than the well casing or borehole wall.

XI. ENFORCEMENT /PENALTIES

The Board shall investigate violations of these regulations and/or violations of any Water Supply Certificate conditions and may take such actions as the Board deems necessary for the protection of the public health and the enforcement of these regulations.

If any investigation reveals a violation of these regulations or the Water Supply Certificate conditions, the Board shall order the private well owner to comply with the violated provision(s) within thirty (30) days or such other time period as the Board deems necessary.

The Board shall further order that failure to comply may result in the issuance of violation tickets.

The order shall be in writing and served in the following manner:

- a) personally, by any person authorized to serve civil process; or
- b) by any person authorized to serve civil process by leaving a copy of the order at the well owner's last and usual place of abode; or
- c) by sending the well owner a copy of the order by registered or certified mail, return receipt requested, if the well owner is within the Commonwealth; or
- d) if the well owner's last and usual place of abode is unknown or outside the Commonwealth, by posting a copy of the order in a conspicuous place on or about the premises and by advertising it for at least three out of five consecutive days in one or more newspapers of general circulation within the municipality wherein the private well affected is situated.

The Board may suspend or revoke any contractor's permit upon a finding that the holder of such permit has violated any of these regulations or has failed to comply with any lawful order of the Board pursuant to these regulations.

Any person who fails to comply with any order issued pursuant to the provisions of these regulations shall be subject to a fine of fifty dollars (\$50.00) per day, per violation pursuant to the non-criminal disposition procedure as set forth in M.G.L., Chapter 40, Section 21D.

XII. HEARING

The private well owner to whom any order has been served may request a hearing before the Board by filing with the Board within seven (7) days after the order was served, a written petition requesting a hearing on the matter. Upon receipt of such petition, the Board shall set a time and place for such hearing and shall inform the well owner thereof in writing. The hearing shall be commenced not later than 30 days after the day on which the order was served. The Board, upon application of the well owner, may postpone the date of hearing for a reasonable time beyond such 30-day period if in the judgment of the Board the well owner has submitted a good and sufficient reason for such postponement. At the hearing the well owner shall be given an opportunity to be heard and to show why the order should be modified or withdrawn. After the hearing, the Board shall sustain, modify, or withdraw the order and shall inform the well owner in writing of its decision. If the Board sustains or modifies the original order, the well owner shall comply within the time period allotted in the original order or in the modification.

Every notice, order, or other record prepared by the Board in connection with the hearing shall be entered as a matter of public record in the office of the Board of Health.

If a written petition for a hearing is not filed with the Board within seven (7) days after the day an order has been served, or, if after a hearing, the order has been sustained in any part, failure to comply with the order as issued or modified shall constitute an additional offense.

XIII. APPEAL

Any person aggrieved by the final decision of the Board may seek relief therefrom within thirty (30) days in any court of competent jurisdiction, as provided by the laws of this Commonwealth.

XIV. VARIANCE

The Board may, after a public hearing, grant a variance to the application of these regulations when, in its opinion, the enforcement thereof would do manifest injustice, and the applicant has demonstrated that the equivalent degree of protection will still be provided to the private water supply without strict application to particular provisions of these regulations.

Every request for a variance shall be made in writing and shall state the specific variance sought and the reasons therefor. The letter shall contain all the information needed to assure the Board that, despite the issuance of a variance, the public health and

environment will be protected. Notice of the hearing shall be given by the Board, at the applicant's expense, at least ten (10) days prior thereto, by certified mail to all abutters of the property upon which the private well is located and by publication in a newspaper of general circulation. The notice shall include a statement of the variance sought and the reasons therefor. Any grant or denial of a variance shall be in writing and shall contain a brief statement of the reasons for approving or denying the variance. A copy of each variance shall be conspicuously posted at the facility serviced by the well for thirty (30) days following its issuance and shall be available to the public at all reasonable hours in the Office of the Board of Health.

Any variance may be subject to such qualification, revocation, suspension, condition, or expiration as is provided in these regulations or as the Board expresses in its grant of the variance. A variance may otherwise be revoked, modified or suspended, in whole or in part, only after the holder thereof has been notified in writing and has been given an opportunity to be heard, pursuant to Section XI of these regulations.

XV. **SEVERABILITY**

If any provision of these regulations or the application thereof is held to be invalid by a court of competent jurisdiction, the invalidity shall be limited to said provision (s) and the remainder of these regulations shall remain valid and effective. Any part of these regulations subsequently invalidated by a new state law or modification of an existing state law shall automatically be brought into conformity with the new or amended law, and shall be deemed to be effective immediately, without recourse to a public hearing and the customary procedures for amendment or repeal of such regulation.

XVI. **EFFECTIVE DATE**

These regulations were amended by vote of the Westwood Board of Health, at their regularly scheduled meeting held on November 8, 2000 and are in full force and effect on and after November 30, 2000. Before said date, these regulations shall be published and copy thereof be placed on file in the Board of Health office and filed with the Department of Environmental Protection, Division of Wastewater Management (formerly the Division of Water Pollution Control) in Boston. These regulations or any portions thereof may be amended, supplemented or repealed from time to time by the Board, with notice as provided by law on its own motion or by petition.

XVII. **DISCLAIMER**

The issuance of a well permit shall not be construed as a guarantee by the Board or its agents that the water system will function satisfactorily nor that the water supply will be of sufficient quality or quantity for its intended use.

Regulation Adopted: May 16, 1996, Amended: November 8, 2000, Effective: November 30, 2000, Amended: March 14, 2001, Effective: April 5, 2001, Amended: October 9, 2002, Effective: October 21, 2002

**Appendix B:
Examples of Relevant Regulations
from Other Towns**

Water Supply District of Acton

693 MASSACHUSETTS AVENUE
P.O. BOX 953
ACTON, MASSACHUSETTS 01720

TELEPHONE (508) 263-9107

FAX (508) 264-0148

Rules and Regulations for Underground Lawn Watering Systems

At the regularly scheduled Commissioners meeting held on September 8, 1997, the Board of Water Commissioners voted to rescind the ban on the installation of underground lawn water systems, and chose to allow the installation of same, with the following conditions.

1. All automatic lawn watering systems, connected to the public water supply, must be equipped with a timing device that can be set to make the system conform to the District's odd/even outdoor watering restrictions.
2. All automatic lawn watering systems must be equipped with some type of moisture sensing device that will prevent the system from starting automatically when not needed.
3. All automatic lawn watering systems must be installed with an approved backflow prevention device (Watts 800 or equal). Said device will be inspected initially by the plumbing inspector and may be inspected periodically after that by water district employees.
4. Any person who now has, or who intends to install an automatic lawn watering system in the future, must notify the Water District office of the existence of said system, or of their intention to install a new system prior to the actual installation. All systems, those currently in existence, as well as any installed in the future, must comply with all Rules and Regulations adopted on this date.
5. Any system not in conformance with the above criteria may be disconnected from the public water supply system.

Ian Cooke

781 575-9911

SERVICE AREA — Any area which contains a loading dock, dumpster or outdoor storage of merchandise, vehicles or equipment.

SHRUB — A woody perennial plant growing to a height of fifteen (15) feet or less at maturity.

SIGHT TRIANGLE — An area free of obstructions which might interfere with a driver's ability to see other vehicles approaching an intersection.

STREET TREE — A tree with characteristics (such as sturdy limbs, deep root system or lack of low branches) which make it desirable for planting near pavement or underground utilities.

TREE — A woody perennial plant growing to a height of fifteen (15) feet or more at maturity.

UNDISTURBED — A landscape design which primarily utilizes existing plants in a natural state and requires no maintenance.

VEGETATED ISLAND — An area inside a paved parking area covered with vegetation instead of pavement.

XERISCAPE — A landscape designed with native, drought-tolerant species which require little fertilizer.

240-119. Performance standards.

For the purposes stated above, the following standards are required to be met. Alternative methods to those described below may be substituted if the applicant demonstrates to the satisfaction of the reviewing agency or special permit granting authority that the intent of this Article is upheld.

A. Xeriscape. To aid in conserving the Town of Falmouth's drinking water supply, xeriscape is required for all applicable development projects unless any of the following criteria are met:

- (1) The applicant provides water for the landscape from a private well.
- (2) The applicant installs an irrigation system (which may use town water) but only those which drip or mist. Spray or sprinkle irrigation using town water is prohibited.

Article 17
FINAL VERSION

TOWN OF FALMOUTH
BY-LAWS

Chapter 223, WATER

[HISTORY: Adopted by the Town of Falmouth as indicated in article histories.
Amendments noted where applicable.]

ARTICLE I, Water Emergency [Adopted AFTM 11-13-2001, Art. 16, approved 3-15-2002EN]

§ 223-1. Authority.

This article is adopted by the Town of Falmouth under its police powers to protect public health and welfare and its powers under M.G.L. c. 40, § 21 et seq. and implements the Town's authority to regulate water use pursuant to M.G.L. c. 41, § 69B. This article also implements the Town's authority under M.G.L. c. 40, § 41A, conditioned upon a declaration of water supply emergency issued by the Department of Environmental Protection.

§ 223-2. Purpose.

The purpose of this article is to protect, preserve and maintain the public health, safety and welfare whenever there is in force a state of water supply conservation or state of water supply emergency by providing for enforcement of any duly imposed restrictions, requirements, provisions or conditions imposed by the Town or by the Department of Environmental Protection.

§ 223-3. Definitions.

For the purpose of this article, the following terms shall have the meanings indicated:
ENFORCEMENT AUTHORITY -- The Town's Department of Public Works or other department or board having responsibility for the operation and maintenance of the water supply, the Board of Health, the Health Agent, Department of Natural Resources, the Police Department and the Conservation Officer.

PERSON -- Any individual, corporation, trust, partnership or association, or other entity.

STATE OF WATER SUPPLY CONSERVATION -- A state of water supply conservation declared by the Town pursuant to § 223-4 of this article.

STATE OF WATER SUPPLY EMERGENCY -- A state of water supply emergency declared by the Department of Environmental Protection under M.G.L. c 21G, § 15-17.

§ 223-4. Declaration of state of water supply conservation.

The Town, through its Board of Selectmen, may declare a state of water supply conservation upon a determination by a majority vote of the Board that a shortage of water exists, or may reasonably be determined to be imminent, and conservation measures are appropriate to ensure the safe and adequate supply of water to all water

consumers. Restrictions shall be applicable to all public and private users of the Town's public water supply system, regardless of any person's responsibility for paying water bills for water used at any particular facility. However, if the Board of Selectmen makes a specific finding that the shortage of water exists because of a clear and imminent threat to the sole source aquifer underlying Falmouth, such threats to include severe drought, environmental pollution or salt water intrusion, the restrictions adopted pursuant to § 223-5 shall apply to all citizens, water users and consumers regardless of the source of water supply. Public notice of a state of water supply conservation shall be given under § 223-6 of this article before it may be enforced.

§ 223-5. Restricted water uses.

A declaration of a state of water supply conservation shall include, but not be limited to, one or more of the following restrictions, conditions, or requirements limiting the use of water as necessary to protect the public supply. The applicable restrictions, conditions or requirements shall be included in the public notice required under § 223-6.

- A. Odd/Even day outdoor watering: Outdoor watering by water users with odd-numbered addresses is restricted to odd-numbered days. Outdoor watering by water users with even-numbered addresses is restricted to even-numbered days.
- B. Outdoor watering hours: Outdoor watering is permitted only during daily periods of low demand, to be specified in the declaration of a state of water supply conservation and public notice thereof.
- C. Washing of sidewalks, driveways and patios is prohibited.
- D. The use of automatic sprinkler systems is prohibited.
- E. The filling of swimming pools is prohibited.
- F. Outdoor watering is prohibited.
- G. Restaurants may not serve water unless requested by patrons.
- H. Pistol-grip-type nozzles are required for all hoses used for outside watering, car washing or boat washing.
- I. Restrictions imposed on commercial car washes.
- J. Mandatory water use reductions by commercial/industrial users.
- K. Restricting private water supply use.
- L. Termination of water service for failure to comply.

§ 223-6. Public notification of state of water supply conservation; notification of DEP.

Notification of any provision, restriction, requirement or condition imposed by the Town as part of a state of water supply conservation shall be published in a newspaper of general circulation within the Town, or by such other means reasonably calculated to reach and inform all users of water of the state of water supply conservation. Any restriction imposed under § 223-5 shall not be effective until such notification is provided. Notification of the state of water supply conservation shall also be simultaneously provided to the Massachusetts Department of Environmental Protection.

§ 223-7. Termination of state of water supply conservation; notice.

A state of water supply conservation may be terminated by a majority vote of the Board of Selectmen, upon a determination that the water supply shortage no longer exists. Public notification of the termination of a state of water supply conservation shall be given in the same manner required by § 223-6.

§ 223-8. State of water supply emergency; compliance with DEP orders.

Upon notification to the public that a declaration of a state of water supply emergency has been issued by the Department of Environmental Protection, no person shall violate any provision, restriction, requirement or condition of any order approved or issued by the Department intended to bring about an end to the state of emergency.

§ 223-9. Penalties.

A. Any person violating this article shall be liable to the Town in the amount of \$50 for the first violation and \$100 for each subsequent violation which shall inure to the Town. Fines shall be recovered by indictment, or on complaint before the District Court, or by noncriminal disposition in accordance with § 21D of Chapter 40 of the General Laws. Each day of violation shall constitute a separate offense.

B. Termination of water service may be imposed subsequent to a fifth offense.

C. Any person granted an exemption must prominently display signs visible to the public that includes the following phrase "OPERATING UNDER A WATER EMERGENCY EXEMPTION ISSUED BY THE BOARD OF SELECTMEN." The Design Review Committee shall determine an acceptable size, shape, description and location of exemption signs. Provided an exemption sign meets the parameters approved by the Design Review Committee, the permit requirements of § 184-13 are waived. All signs must be immediately removed whenever the emergency no longer exists or be subject to the penalties of § 223-9.

D. Commercial agricultural uses and golf courses shall be exempt from all provisions of this Article with the exception of the use of the Town Public Water Supply.

§ 223-10. Severability.

The invalidity of any portion or provision of this article shall not invalidate.

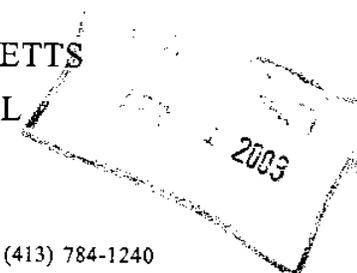


TOM REILLY
ATTORNEY GENERAL

THE COMMONWEALTH OF MASSACHUSETTS
OFFICE OF THE ATTORNEY GENERAL

WESTERN MASSACHUSETTS DIVISION
1350 MAIN STREET
SPRINGFIELD, MASSACHUSETTS 01103-1629

(413) 784-1240
www.ago.state.ma.us



March 13, 2003

Bonnie T. Pena-Andrade, Town Clerk
59 Town Hall Square
Falmouth, MA 02540

RE: Falmouth Annual Town Meeting of November 18, 2002 — Case # 2363
Warrant Articles # 9, 17, and 38 (General)
Warrant Articles # 3, 4, 6, and 7 (Zoning)

Dear Ms. Pena-Andrade:

Articles 3, 4, 6, 7, 9, 17, and 38 - I return with the approval of this Office the amendments to the town by-laws adopted under these Articles on the warrant for the Falmouth town meeting that convened on November 18, 2002.

Article 17 - The amendments adopted Article 17 delete Section 223-1 through 223-10 of the town's general by-laws and insert new Section 223-1 through 223-10. Sections 223-1 through 223-10 contain the town's water conservation by-law.

Section 223-4 pertains to the board of selectmen's authority to declare a state of water supply conservation and provides in pertinent part as follows:

However, if the Board of Selectmen makes a specific finding that the shortage of water exists because of a clear and imminent threat to the sole source aquifer underlying Falmouth, such threats to include severe drought, environmental pollution or salt water intrusion, the restrictions adopted pursuant to § 223-5 shall apply to all citizens, water users, and consumers regardless of the source of water supply.

In approving the above-quoted text, we remind the town of the provisions of G.L. c. 21G, §§ 15-17. General Laws Chapter 21G, Sections 15, 16, and 17, pertain to the issuance of a declaration of a state of water emergency. General Laws Chapter 21G, Section 15, authorizes any town that operates a public water system to petition the Department of Environmental Protection for a declaration of a State of Water Emergency. Section 15 also

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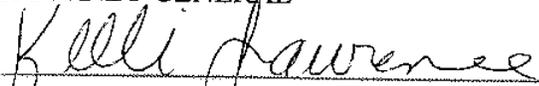


authorizes the Department of Environmental Protection to require the town to submit a plan designed to bring about an expeditious end to the State of Water Emergency to the Department for review and approval. Such plan may include provisions for taking actions and for restraining the use of water on public or private premises by shutting off the water at a meter or at the curb cock. Section 16 of Chapter 21G authorizes the operator of a public water system affected by the emergency to take by eminent domain the right to use land. Section 17 authorizes the Department of Environmental Protection to issue orders applicable within or outside the area in which a water emergency exists.

Based on discussions with the Department of Environmental Protection, I understand that if the Board of Selectmen make a finding that there is an imminent threat to the town's sole source aquifer due to severe drought, environmental pollution or salt water intrusion, the restrictions adopted under Section 223-5 may not be sufficient to bring an end to the threat. If the board makes such a finding, according to the Department of Environmental Protections, the town may need to avail itself of the provisions of G.L. c. 21G, §§ 15-17, to adequately address the town's water supply concerns. The town may wish to discuss this issue in more detail with town counsel and the Department of Environmental Protection.

Very truly yours,

THOMAS F. REILLY
ATTORNEY GENERAL

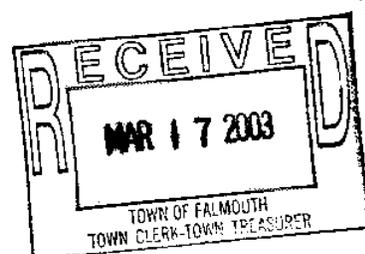

by: Kelli E. Lawrence, Assistant Attorney General
By-law Coordinator, Municipal Law Unit
1350 Main Street, 4th Floor
Springfield, MA 01103-1629
(413) 784-1240, x 117

enc.

pc:

Town Counsel

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**ARTICLE 17
AND THE VOTE THEREON
AT THE ANNUAL FALL TOWN MEETING
CONVENED AT FALMOUTH, MASSACHUSETTS
NOVEMBER 18, 2002**

ARTICLE 17: To see if the Town will vote to amend Article 1 of Chapter 223 of the Code of Falmouth by deleting sections 223-1 through and including 223-10 and inserting in its place the following:

Article 1

Chapter 223, WATER

§ 223-1. Authority.

This article is adopted by the Town of Falmouth under its police powers to protect public health and welfare and its powers under M.G.L. c. 40, § 21 et seq. and implements the Town's authority to regulate water use pursuant to M.G.L. c. 41, § 69B. This article also implements the Town's authority under M.G.L. c. 40, § 41A, conditioned upon a declaration of water supply emergency issued by the Department of Environmental Protection.

§ 223-2. Purpose.

The purpose of this article is to protect, preserve and maintain the public health, safety and welfare whenever there is in force a state of water supply conservation or state of water supply emergency by providing for enforcement of any duly imposed restrictions, requirements, provisions or conditions imposed by the Town or by the Department of Environmental Protection.

§ 223-3. Definitions.

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supply. Public notice of a state of water supply conservation shall be given under § 223-6 of this article before it may be enforced.

§ 223-5. Restricted water uses.

A declaration of a state of water supply conservation shall include, but not be limited to, one or more of the following restrictions, conditions, or requirements limiting the use of water as necessary to protect the public supply. The applicable restrictions, conditions or requirements shall be included in the public notice required under § 223-6.

- A. Odd/Even day outdoor watering: Outdoor watering by water users with odd-numbered addresses is restricted to odd-numbered days. Outdoor watering by water users with even-numbered addresses is restricted to even-numbered days.
- B. Outdoor watering hours: Outdoor watering is permitted only during daily periods of low demand, to be specified in the declaration of a state of water supply conservation and public notice thereof.
- C. Washing of sidewalks, driveways and patios is prohibited.
- D. The use of automatic sprinkler systems is prohibited.
- E. The filling of swimming pools is prohibited.
- F. Outdoor watering is prohibited.
- G. Restaurants may not serve water unless requested by patrons.
- H. Pistol-grip-type nozzles are required for all hoses used for outside watering, car washing or boat washing.
- I. Restrictions imposed on commercial car washes.
- J. Mandatory water use reductions by commercial/industrial users.
- K. Restricting private water supply use.
- L. Termination of water service for failure to comply.

§ 223-6. Public notification of state of water supply conservation; notification of DEP.

Notification of any provision, restriction, requirement or condition imposed by the Town as part of a state of water supply conservation shall be published in a newspaper of general circulation within the Town, or by such other means reasonably calculated to reach and inform all users of water of the state of water supply conservation. Any restriction imposed under § 223-5 shall not be effective until such notification is provided. Notification of the state of water supply conservation shall also be simultaneously provided to the Massachusetts Department of Environmental Protection.

§ 223-7. Termination of state of water supply conservation; notice.

A. A state of water supply conservation may be terminated by a majority vote of the Board of Selectmen, upon a determination that the water supply shortage no longer exists. Public notification of the termination of a state of water supply conservation shall be given in the same manner required by § 223-6.

B. Upon notification to the public that a declaration of a state of water supply emergency has been issued by the Department of Environmental Protection, no person shall violate any provision, restriction, requirement or condition of any order approved or issued by the Department intended to bring about an end to the state of emergency.

§ 223-8. State of water supply emergency; compliance with DEP orders.

§ 223-7. Penalties.

A. Any person violating this article shall be liable to the Town in the amount of \$50 for the first violation and \$100 for each subsequent violation which shall inure to the Town. Fines shall be recovered by indictment, or on complaint before the District Court, or by noncriminal disposition in accordance with § 21D of Chapter 40 of the General Laws. Each day of violation shall constitute a separate offense.

B. Termination of water service may be imposed subsequent to a fifth offense.

C. Any property owner who posts an exemption sign without the written approval of the Board of Selectmen shall be liable to the Town in the amount of \$300.00 per offense. Each day of violation shall constitute a separate offense.

§ 223-8. Severability.

The invalidity of any portion or provision of this article shall not invalidate any other portion or provision thereof.

§ 223-9. Exemptions:

A. Any person suffering a significant financial hardship because of the restrictions imposed under this by-law may appeal to the Board of Selectmen for an exemption from all or some of the restrictions. After a public hearing, duly noticed at the applicant's expense at least 10 days prior to the hearing in a newspaper of general circulation in the Town of Falmouth, the Board of Selectmen may grant appropriate relief to the applicant from all or some of the restrictions. Under no circumstances may the Board grant any relief unless the applicant first provides a written water conservation plan that the applicant shall be required to adhere to during the course of the emergency exemption.

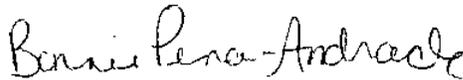
B. Failure to abide by the terms of an approved water conservation plan shall nullify any exemption granted pursuant to this section.

C. Any person granted an exemption must prominently display signs visible to the public that includes the following phrase "OPERATING UNDER A WATER EMERGENCY EXEMPTION ISSUED BY THE BOARD OF SELECTMEN." The Design Review Committee shall determine an acceptable size, shape, description and location of exemption signs. Provided an exemption sign meets the parameters approved by the Design Review Committee, the permit requirements of § 184-13 are waived. All signs must be immediately removed whenever the emergency no longer exists or be subject to the penalties of § 223-9.

Or to take any other action on this matter. On the request of the Board of Selectmen

VOTED: : By a two-thirds majority vote, a quorum being present on Monday, November 18, 2002, Article 17 was amended to have Article 1 of the Town Bylaws, Section 223, WATER; Subsection 223-9, **EXEMPTIONS** to add Subsection D: Commercial agricultural uses and golf courses shall be exempt from all provisions of this Article with the exception of the use of the Town Public Water Supply.

A TRUE COPY ATTEST,



**Bonnie Pena-Andrade, Town Clerk
FALMOUTH, MASSACHUSETTS**

Northboro

MOTION: THE BOARD OF WATER AND SEWER COMMISSIONERS
at their regular meeting on Jan 14 1985
voted to adopt the following:

In order to conserve the supply of potable water
the Commissioners instruct the Superintendent to
include in his regulations governing the department
the following:

All future applicants for connection to the water
system will be notified that no connection will be
made to any service, any part of which is directly
connected to a system designed to use the Town
supplied water for purposes such as landscape
watering, fountains, or any other uses not essential
to securing necessary occupancy permits and human
habitation, the Superintendent shall further take
any steps available to him to control such uses on
existing services, and to control the use of all
uses not essential to proper human occupancy.

1. John M. Kelly
2. James E. Smith
3. Eric M. ...
4. _____

Post-it* Fax Note	7671	Date	7/1/03	# of pages	1
To	Ian Cook	From	Kara Branoski		
Co./Dept		Co.	Northborough		
Phone #		Phone #	508-393-5032	Water	
Fax #	781-575-9971	Fax #			



TOWN OF WESTBOROUGH MASSACHUSETTS

OFFICE OF THE TOWN CLERK
NANCY J. YENDRIGA, TOWN CLERK

TOWN HALL
34 WEST MAIN STREET
WESTBOROUGH, MA 01581-1998
TEL. (508) 366-3020

THIS IS TO CERTIFY that at the Town Meeting in the Town of Westborough, duly called as required by law, and held on March 12, 1996 and continued to March 23, 1996 and at an adjourned session on March 26, 1996 in the High School Auditorium on West Main Street (a quorum being present) it was

VOTED: under

ARTICLE 71: to amend its Town Bylaws by adding a new Article as follows:

"No person shall make any opening in or connection with any town water pipe or otherwise use water from the town water system for the purpose of providing an underground lawn sprinkler system at its residence or place of business. Residential systems in existence on January 1, 1996 are exempt from the provisions of the bylaw - Commercial systems in existence as of the effective date of this bylaw will have one year in which to transfer their underground system to a private water source. For purposes of this section, each successive day on which any violation is committed or continued shall be a separate offense,"

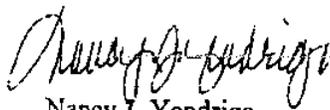
and to add the following language to Section 37 of the Town Bylaws:

Town Bylaws

Article 38. Underground Sprinkler Systems: A violation shall be \$100.

The vote was in the majority, motion carries, a quorum being present.

Attest:


Nancy J. Yendriga
Town Clerk

Norfolk Water Commission Regulation

Underground Lawn Sprinklers or Systems

Effective September 23, 1991, the Norfolk Water Department will not allow the connection to its Water System of any new commercial or residential underground lawn watering or sprinkling system for which a permit has not been issued prior to September 23, 1991.

Nothing contained in this regulation is intended to prevent or prohibit the watering or sprinkling of lawns with water from private well systems provided that no such existing privately sourced sprinkler system may be hereafter connected to the Town water supply.

All existing underground sprinkler systems must hereafter comply with all applicable state and local codes and regulations as in effect from time to time.

Town of Stoughton

10 Pearl Street • Stoughton, MA 02072 • (781) 341-1300 • FAX (781) 344-5048

GUIDELINES FOR BOARD OF HEALTH APPROVAL OF ALLOWING A SOLE DOMESTIC WATER SUPPLY WELL ON THE LOT TO SUPPLY A SUBSURFACE IRRIGATION SYSTEM

All applicants are advised to properly install a second well designated for irrigation use. A variance from Stoughton Board of Health Regulations shall be applied for by all applicants in accordance with all applicable requirements. All of the following information shall be submitted to the Board for review at least 10 days prior to the hearing:

- 1) A copy of the pump test of the well to demonstrate production or yield.
- 2) The number of bedrooms served.
- 3) A plan of the site being served (a hand drawn sketch if it is adequately prepared) including:
 - a) physical distinguishing features of the lot including building footprint(s), driveway, etc.
 - b) proposed area to be watered.
 - c) sprinkler heads.
 - d) piping, size and construction.
 - e) the number of zones and the corresponding sprinkler heads of the zones.
 - f) sprinkler head pattern.
- 4) Performance specification including; PSL, Radius coverage (ft), G.P.M. and Precipitation (in/hr) of the sprinkler heads obtained by the manufacture.
- 5) Design pressure of the system.
- 6) Performance data of the pump including designated rating curves and general mechanical specifications.
- 7) System operating cycle including days and times of operation.
- 8) Length of time for watering of each zone daily.
- 9) Time of day system operates.
- 10) Total gallons per day (G.P.D.) of water used by the system.
- 11) The total recovery time of the well.
- 12) Description of the Backflow Preventing Valve and location of the fixture.

All of the information shall be furnished to the Board by the homeowner/applicant with the assistance of the irrigation system designer contractor

Minimum Fixed Yield

All wells shall have a minimum fixed yield of 7 G.P.M. to be considered for approval by the Board for both of these uses. In all other instances, a second well is required to be permitted and installed upon the applicant demonstrating compliance with

Walpole

GREATER THAN 100,000 C. F. PER YEAR IS PROPOSED TO BE USED

1. These proposed large water users must provide the Board of Sewer and Water Commissioners with projected water use calculations, with a description of all uses of water within such area or facility.
2. Usage of multiple meters serving the same geographic area or facility will be added together and considered one customer.

WATER PERMIT REQUIREMENTS THROUGH AGREEMENT OR CONTRACT WITH THE BOARD OF SEWER & WATER COMMISSIONERS

1. No outside irrigation systems shall be connected to the Town's system.
2. Low flow plumbing fixtures shall be installed as per Mass Uniform State Plumbing Code and Mass Building Code, as most recently amended.
3. Utilization of landscaping materials and principles that are designed to minimize water consumption, (i.e. xeriscaping).

COMPLIANCE

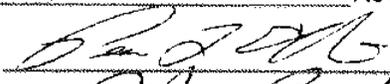
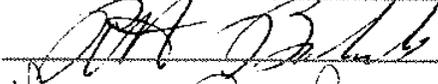
1. Compliance with this regulation is a condition of service from the utility.
2. The Water Department Staff may conduct an inspection of a customer's property for the purpose of assessing the validity and/or compliance of this regulation. Inspections shall be conducted with the voluntary consent of the customer or the customer's representative. Inspection is deemed a condition of service. Customer refusal of an inspection for these purposes will result in termination of service after notification.

Post-it® Fax Note: 7671	Date 6/26/03	# of pages 1
To MELISSA DENIS	From RICK MATSON	
Co /Dept NEARWA	Co WALPOLE WATER	
Phone #	Phone #	
Fax # (781) 575-9871	Fax #	

MASHPEE WATER DISTRICT
POLICIES AND PROCEDURES

Irrigation Policy
Policy #023

Date: 4/11/1994 Revision: 6/28/2000

Approved: 

Wesley M. Rammelmeyer

PURPOSE

In order to maximize conservation of District water, and to enable the Mashpee Water District to continue to grow at the current rate while providing quality water and dependable fire flow, this policy, when instituted, will prohibit all *future* Mashpee Water District customers from connecting automatic outside irrigation to their District water service. Should *future customers* wish to use automatic outside irrigation, they must use a private well to supply the system. This is an amendment to District Policy.

IMPLEMENTATION

II. As of March 10, 1998 the Mashpee Water District has not allowed *new* District customers to use District water for outside automatic irrigation. New applicants will be required to sign a form agreeing to use an alternate source to supply any automatic outside irrigation.

II. *Existing customers* of the Mashpee Water District are, as of this date required to utilize the following equipment on their automatic outside irrigation systems: Rain sensors (set at ¼" of rain), low flow heads (range ½ gpm to 3 gpm). In addition, we request owners set their systems to ½" of water per week. The District can provide information on these devices if requested. **Existing District customers that currently have irrigation connected to the Mashpee Water District that have a private well available for irrigation, shall connect the irrigation to the private well.**

III. District customers who do not have automatic irrigation and choose to have it installed, must connect it to a different source of supply (private well).

IV. District customers who use hoses and sprinklers to water outside are urged to do so responsibly. To include: never leave sprinklers unattended, do not over water and to use private wells when possible.

V. In order to assist the District greatly in the conservation of water we have begun a voluntary outside use restriction: *Users who live at even numbered house addresses water on even days only, users who live at odd numbered house addresses water on odd days only.*

VI. Fire hydrant water meters will not be issued for irrigation use.

VII. Customers with existing sprinkler systems shall not increase the amount of sprinklers or the coverage area of the system. Should a system be increased, water service will be terminated until such time the system is returned to the original size.

**THE BOARD OF WATER COMMISSIONERS RESERVES THE RIGHT TO
INSTITUTE A BAN OF ALL OUTSIDE USE DURING PERIODS OF WATER
EMERGENCY.**

Town of Sudbury
ARTICLE XXVII
IN-GROUND IRRIGATION SYSTEMS

Purpose: It is the purpose of this bylaw to establish requirements for the installation of in-ground irrigation systems on residential properties for the protection of the quality and quantity of water supplied by the Sudbury Water District.

Applicability: All in-ground irrigation systems serving residential uses installed after the effective date of this bylaw will be required to comply with the following:

1. Installation of new in-ground irrigation systems and expansion of existing systems will be permitted only when the source of water supply is a private well owned and under the control of the property owner or a legally created organization of the owners of property using the well.
2. All wells installed for the purposes of this bylaw shall be subject to the regulations of the Sudbury Board of Health. All wells shall be tested for coliform bacteria and shall require treatment if such tests indicate the presence of coliform.
3. Installation and continued operation of such systems will be in accordance with the requirements herein:
 - a) Private wells for irrigation purposes shall not be located within one hundred (100) feet of a sewage disposal system, within one hundred (100) feet of an existing potable water supply well and within one hundred (100) feet of a wetland or vernal pool.
 - b) All wells shall be dug or drilled to a minimum depth of 100 feet, unless it is demonstrated through hydrogeological analysis that the cone of influence of the well at its maximum pumping capacity does not intercept any surface water resource.
 - c) There will be no connection between the private water supply and the municipal water service. Separation using valves or removable sections of pipe is prohibited.
 - d) Discharge of water from the private water supply will be through sub-surface sprinkler heads that rise when activated by water pressure. Water from this source will not be available through sill cocks, garden hoses or any other points.
 - e) The purpose of the private water supply is limited to irrigation of lawn and plants, and is not to be used for washing automobiles, filling swimming pools or as a potable water supply.

4. Irrigation systems sourced by private water supplies and operated as described herein shall not be limited to specific hours of operation nor odd/even days of use if the Town declares a water emergency.
5. All irrigation systems shall utilize moisture sensors.
6. An Integrated Pest Management Plan shall be compiled and submitted with an application to install an in-ground irrigation system. The plan shall encourage minimal use of fertilizers and pesticides by use of non-chemical methods to control pests, such as by the use of indigenous species of plants.
7. Sellers of property covered by these regulations are responsible to inform the purchaser of these requirements in any purchase and sale agreement.
8. A permit to install a new in-ground irrigation system shall be required from the Board of Health and fees for review and inspection shall be established. All other state, federal or local approvals shall be required where necessary.

Exceptions: In-ground irrigation systems installed on land used primarily and directly for the raising of fruits, vegetables, berries, nuts and other foods for human consumption, feed for animals, flowers, trees, nursery or greenhouse products, and ornamental plants and shrubs; or on land to be used in a related manner which is incidental thereto and represents a customary and necessary use in raising such products.



COMMONWEALTH OF MASSACHUSETTS
 EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 Metropolitan Boston – Northeast Regional Office

MITT ROMNEY
 Governor

KERRY HEALEY
 Lieutenant Governor

ELLEN ROY HERZFELDER
 Secretary

EDWARD P. KUNCE
 Acting Commissioner

MODIFIED WATER WITHDRAWAL PERMIT
MGL c 21G

This Modified Permit is issued pursuant to the Massachusetts Water Management Act ("the Act") for the sole purpose of modifying the terms and conditions governing the withdrawal of water authorized herein. This Modified Permit conveys no right in or to any property beyond the right to withdraw the volume of water for which it is issued.

PERMIT NUMBER: 9P-3-17-298.01

RIVER BASIN: Ipswich

PERMITTEE: Town of Topsfield
 Town Hall
 8 West Common Street
 Topsfield, MA 01983

ORIGINAL ISSUANCE DATE: July 31, 1991
MODIFICATION DATE: May 19, 2003
EXPIRATION DATE: August 31, 2009

NUMBER OF WITHDRAWAL POINTS:
 Groundwater: 1
 Surface Water: 0

USE: Public Water Supply

DAYS OF OPERATION: 365

LOCATION:

<u>Source</u>	<u>Source Code</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Location</u>
North St. Well	3298000-01G	42 39 10 N	70 56 35 W	4 Pump House Lane

This information is available in alternate format. Call April McCabe, ADA Coordinator at 1-617-556-1171.

205A Lowell St. Wilmington, MA 01887 • Phone (978) 661-7600 • Fax (978) 661-7615 • TTD# (978) 661-7670

DEP on the World Wide Web: <http://www.mass.gov/dep>

Printed on Recycled Paper

Water Withdrawal Permat #: 9P-3-17-298.01

Permittee: Town of Topsfield

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SPECIAL CONDITIONS**1. Maximum Authorized Annual Average Withdrawal Volume**

This Modified Permit authorizes the withdrawal of water, for the purpose of serving the businesses, municipal facilities, institutions and residences in the Town of Topsfield (the "Town" or "Topsfield") at the rate described below on average over a calendar year. The volume reflected by this rate is in addition to the 0.43 million gallons per day (MGD) previously registered to the permittee through the Water Management Act Program. The Department of Environmental Protection (the "Department" or "DEP") will use raw water volumes when assessing compliance with the volumes authorized by the Town's Registration and this Modified Permit.

The permitted volume is expressed in millions of gallons, both as an average daily withdrawal rate per year, and as a total annual withdrawal volume for each period of the Modified Permit term.

Withdrawals are authorized as follows:

		Daily Average (MGD)	Total Annual (MGY)
Period One			
Years 2-5	7/31/1991 to 8/31/1994	0.17	62.05
Period Two			
Years 6-10	9/1/1994 to 8/31/1999	0.17*	62.05
Period Three			
Years 11-15	9/1/1999 to 5/18/2003	0.23	83.95
Period Four			
Years 16-20	5/19/2003 to 8/31/2009	0.17 *	62.05

*Because actual withdrawal volumes have been significantly below allocated amounts and since there is insufficient water available in the basin to support increased withdrawals, the Department held the Town's permitted withdrawal volumes throughout the remainder of this Modified Permit to the volume originally allocated for Period One.

If for any year beginning with calendar year 2004, the Town exceeds its total authorized volume of 0.60 mgd on an average annual daily basis, on or before March 1st of the following year, the Town shall submit to the Department for its review and approval a plan and schedule for implementing a water bank. Thereafter, the Town shall implement the water bank as approved by the Department.

At a minimum, this water bank shall provide for conserving at least two gallons of water within the basin for every additional gallon of water demand added to the system. This water bank requirement applies even if the Town exceeds its total authorized volume on an average annual daily basis by an amount that is less than the threshold volume. If the Town exceeds its total authorized volume on an average annual daily basis by more than the threshold amount, the Town will be in violation of the Water Management Act and this Modified Permit.

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2. Maximum Authorized Daily Withdrawal Volume

Withdrawals from individual withdrawal points are not to exceed the approved maximum daily volume listed below without specific advance written approval from the Department.

Source	Source Code	Daily Rate in Million Gallons per Day (MGD)
North St. Well	3298000-01G	1.30

3. Zone of Contribution (Zone II or Zone III) Delineations

Department records show that the North Street Wellfield (3298000-01G) has a DEP approved Zone II delineation. Therefore, no further Zone II work is required as a condition of this Modified Permit.

4. Wellhead Protection

The Town has adopted a Groundwater Protection District bylaw that meets the requirements of 310 CMR 22.21(2), however, the Town has not implemented a floor drain bylaw. The Town shall submit a floor drain regulation, developed through the Board of Health, or a bylaw adopted by Town meeting, to the Department for review and approval by December 1, 2003, prior to being finalized by the Board of Health or adoption at Town meeting. The floor drain regulation approved by the Board of Health or the bylaw approved by Town meeting shall be submitted to the Department within 30 days of adoption.

5. Wetlands Monitoring

The Town has completed ten years of wetlands monitoring of the wetlands adjacent to the North Street wellfield. Based upon our review of the monitoring reports it appears that the reported wetness index has remained the same or is moving towards a slightly wetter condition, therefore the operation of the North Street well has not resulted in measurable impact to the wetlands adjacent to the North Street well. As a result the Department no longer requires monitoring of this wetland by the Town as a condition of this Modified Permit.

6. Streamflow Triggers and Outside Water Use Restrictions

Beginning on June 1, 2003, the Town shall implement the Required Actions identified in the following table whenever streamflow falls below the levels identified for 3 consecutive days as measured at the USGS Stream gauge noted.

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Period	Streamflow Trigger (3 consecutive days below threshold)	Flow Volume (USGS USGS Ipswich Gauge Station 01102000)	Required Action
May 1st thru September 30 th	< 0.56 cfsm	< 70.0 cfs	Public Notice for Voluntary Water Restrictions
May 1st thru September 30 th	< 0.42 cfsm	< 52.5 cfs	Implementation of Mandatory Water Restrictions

cfsm = cubic feet per second per square mile
 cfs = cubic feet per second

* The streamflow thresholds set forth above are the daily mean streamflows recorded at the applicable USGS gauge. Should the reliability of flow measurements at the Ipswich Gauge Station be so unpaired as to question its accuracy, the Modified Permit holder may request for the Department's review and approval that the trigger mechanism be transferred to the USGS South Middleton Gauge #01101500. The implementation of restrictions will be triggered by the same cfsm values that translate to a flow of 24.9 cfs for voluntary restrictions, and 18.7 cfs for mandatory restrictions. Should the Department become aware of concerns about the reliability of either gauge, it may upon immediate notification to the permit holder transfer the measurement point to the an alternate gauge. The Department reserves the right to require use of a different gauge.

Both Required Actions, voluntary or mandatory restrictions, require the filing of a public notice that must appear at a minimum in a local newspaper within 5 business days of the date that the required action is triggered. A copy of each notice as published shall be forwarded to the Department within 10 business days of publication. Each notice shall at a minimum include:

1. the streamflow value that triggered the required notification;
2. the need to limit water use, especially nonessential outside water use, to protect streamflow for aquatic life and to ensure a sustainable drinking water supply;
3. ways individual homeowners can limit water use, especially nonessential outside water use; and
4. in the case of mandatory restrictions, a detailed description of the restrictions and the penalties for violating the restrictions...

At a minimum, mandatory restrictions shall limit nonessential outside water use to hand held hoses only and include hourly restrictions on nonessential outside water use. At a minimum, hourly restrictions shall avoid water use during the hours 9 a.m. to 5 p.m. when evapotranspiration rates are typically the highest. Notwithstanding the foregoing, irrigation of public parks and recreational fields by means of automatic sprinklers equipped with moisture sensors or similar control technology may also be permitted outside of the hours 9 a.m. to 5 p.m. For purpose of this Modified Permit, the term nonessential outside water use is defined to include those uses that do not have health or safety impacts, are not required by regulation and are not needed to meet the core functions of a business or other organization. The Town shall have the authority to enforce mandatory restrictions, including the authority to assess penalties or impose fines for violations.

The Town shall implement, and in the case of mandatory restrictions, enforce the restrictions until streamflow exceeds for seven consecutive days the applicable streamflow threshold set forth in the table above.

In order to evaluate the effectiveness of the restrictions on nonessential outside water use, the Department requires that the Town submit with the Annual Statistical Report, a report documenting all actions taken by the Town to implement and enforce the restrictions on

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nonessential outside water use, including without limitation the dates the restrictions on nonessential outside water use were in place, the streamflow threshold that triggered the restrictions, the restrictions imposed and the Town's efforts to enforce the restrictions including the names and addresses of those against whom action was taken and any fines or penalties imposed.

7. Ipswich River Basin Performance Standards

Beginning calendar year 2004, Topsfield shall meet the following performance standards ("the Ipswich River Basin Performance Standards").

Performance Standard for Unaccounted for Water

Unaccounted for water shall not exceed 10% of overall water use.

Topsfield's Annual Statistical Report shall provide a detailed assessment of its unaccounted for water. Unaccounted for water is defined by the Massachusetts Water Resources Commission as the difference between water pumped or purchased and water that is metered or confidently estimated. Unaccounted for water shall include water that cannot be accounted for due to meter problems, unauthorized hydrant openings, unavoidable leakage, recoverable leakage, illegal connections, stand pipe overflows and fire protection.

The need for water main flushing and the use of water in construction or meter calibration shall be metered or estimated as appropriate to assist in determining actual demand. Volumes flushed to waste shall be reported on the Town's Water Supply Annual Statistical Report.

Performance Standard for Residential Per Capita Water Use

Residential Per Capita Water Use shall not exceed 65 gallons per day.

Topsfield shall report its residential gallons per capita per day (rgpcd) and the calculation used to derive that figure as part of its Annual Statistical Report. The rgpcd is the total volume of residential water use in gallons divided by the population served. The source of the data used to establish the service population and the year in which this data was developed shall be provided. If Topsfield fails to meet the performance standard for keeping residential per capita water use at or below 65 gallons per day, the Department may require the Town to implement restrictions on nonessential outside water use that are more stringent than the restrictions set forth in Special Condition #6.

Performance Standard for Seasonal Water Use

Water use between May 1st and September 30th shall not exceed the seasonal cap of 84.15 million gallons. To stay within this cap Topsfield shall keep its water use at or below an average daily volume of 0.55 MGD from May 1st thru September 30th. If the Town exceeds this seasonal cap, the Department may require the Town to implement more stringent restrictions on nonessential outside water use than those set forth in Special Condition #6.

Performance Standard for Restricting the Use of Unregulated Irrigation Wells

The Department has been informed that within the Ipswich River Basin there has been an increase in the number of wells that are not subject to regulation under the Water Management

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Act and are used in whole or in part for irrigation purposes (hereinafter "unregulated irrigation wells"). To avoid a further increase in the number of such wells, the Department determined that because of the stressed nature of the Ipswich River, it is appropriate that the communities located in the Ipswich River Basin make the use of unregulated irrigation wells subject to the restrictions on nonessential outside water use that are triggered by streamflow thresholds, that are required by this Modified Permit, and that apply to customers of the public water system.

The Department requires that the Town submit, with the Annual Statistical Report, a report documenting all actions taken by the Town to make unregulated irrigation wells subject to the restrictions on nonessential outside water use triggered by streamflow thresholds, that are required by this Modified Permit, and that apply to customers of the public water system, including any actions taken to enforce these restrictions against the owners or operators of unregulated irrigation wells and any fines or penalties imposed. If, in any calendar year beginning 2005, Topsfield, on or before May 1st of that year, fails to restrict the use of unregulated irrigation wells as provided herein, the Town shall implement and enforce the restrictions on nonessential outside water use triggered by the streamflow thresholds set forth below in place of the streamflow thresholds set forth in Special Condition #6.

Period	Streamflow Trigger (3 consecutive days below threshold)	Flow Volume (USGS Ipswich Gauge Station #01102000)	Required Action
May 1st thru September 30 th	< 0.56 cfsm	< 70.0 cfs	Public Notice for Voluntary Water Restrictions
May 1st thru September 30 th	< 0.42 cfsm	< 52.5 cfs	Implementation of a Total Non-Essential Outside Water Ban

cfsm = cubic feet per second per square mile
 cfs = cubic feet per second

8. Enhanced Water Conservation Plan

If, in any year beginning with calendar year 2004, Topsfield fails to comply with the Performance Standards for Residential Per Capita Water Use and/or Seasonal Water Use, the Town shall develop and implement an enhanced water conservation plan for the following calendar year. For any year in which the Town is required to develop and implement an enhanced water conservation plan, the Town shall submit along with the Annual Statistical Report a report documenting all actions taken by the Town to develop and implement the enhanced water conservation plan.

The enhanced water conservation plan may include without limitation the items listed below:

- Adoption and enforcement of a bylaw or regulation to require moisture sensors or similar control technology on automatic sprinklers;
- Adoption and enforcement of a bylaw or regulation to limit the amount of land clearing for the creation of lawns;
- Adoption and enforcement of a bylaw or regulation to promote infiltration of stormwater to recharge groundwater at a rate 1.5 times the volume of recharge for new development projects and a rate of 1.0 times the volume of recharge for redevelopment projects for the appropriate hydrologic group as identified in Standard 3 of the DEP Stormwater Management Standards;
- Irrigation of recreational fields and public parks in accordance with the Water Resources Commission's May 2002 Guide to Lawn and Landscape Water Conservation;

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- Encouragement of the use of cisterns or rain barrels for outside watering thru the use of a rebate or at cost program;
- Enhanced public education outreach; and/or
- Purchase and/or development of out-of-basin sources.

At a minimum, the enhanced water conservation plan shall meet the requirements set forth below.

- If Topsfield fails to comply with the performance standard for keeping residential per capita water use at or below 65 gallons per day, the enhanced water conservation plan shall include the implementation of a program to make water saving devices such as faucet aerators, low flow shower heads and toilet displacement bottles/dams available to its customers at cost and to provide rebates or other incentives for the purchase of low flow appliances (washing machines, dish washers and toilets), and the installation of moisture sensors or similar control technology on irrigation systems.
- Any enhanced water conservation plan required by this Modified Permit shall include (1) submission of a report that evaluates the effectiveness of a differential rate for seasonal water use as a tool for encouraging water conservation, (2) implementation of any changes to the current rate structure that will enable the Town to encourage water conservation such as in a differential rate for seasonal water use, and (3) notification to the Department of the changes along with the reason for these changes.

9. Control of Unaccounted for Water

At a minimum, the Town shall take the actions listed below to meet the performance standard for keeping unaccounted for water at or below 10%.

Metering

100 percent of the system (including public buildings and facilities) shall be equipped with meters of proper size and accuracy to measure water flow within 2% accuracy.

On or before December 31, 2003, the Town shall submit to the Department a plan and schedule for ensuring that all service meters accurately measure within 2 % the volume of water used by the Town's customers. At a minimum, the plan shall include the provision of sufficient funds in the annual Water Department budget to recalibrate, repair or replace meters as needed. Thereafter, the Town shall implement the program.

The Town shall continue to calibrate all master meters on an annual basis.

Leak Detection

The Town shall continue to conduct a full leak detection survey every year.

Leak Repair

The Town shall have repair reports available for inspection by the Department.

Leaks shall be repaired as soon as possible including leaks in any water pipes up to the service meter. In no event, shall any leak remain unrepaired for more than seven days after detection.

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10. Requirement to Report Raw and Finished Water Volumes

Topsfield shall report on the Annual Statistical Report both the raw and finished water volumes for the entire water system. Raw water volumes shall also be reported for individual sources.

11. Commercial and Industrial Conservation Program

The Department has determined that the Town does not need to implement a special program to reduce water use by its ten (10) largest industrial and commercial customers since the amount of commercial and industrial use is substantially less than residential, municipal and institutional (school) use. Resources will be better spent on reducing seasonal water use and residential gallons per capita per day.

12. General Conservation Requirements

Pricing

The Town shall continue to ensure that water supply system operations are fully funded by water supply system revenues. The pricing system should at least reflect the full cost of supplying water, including but not limited to:

- Administrative costs;
- Staff salaries, benefits, insurance and pension costs;
- Distribution system operation, maintenance and repair, including leak detection and repair costs and metering costs;
- Pumping costs and utilities;
- Treatment costs;
- Capital replacement costs, capital depreciation and debt service;
- Costs incurred by the public water system for water conservation programs and public education programs;
- Watershed or wellhead purchase and/or protection costs and land acquisition;
- Emergency planning.

Plumbing

- o The Town shall enforce the March 1, 1989 plumbing code for new construction and building rehabilitation where installation of water saving devices and low flow toilets is required.
- o Public buildings shall be retrofitted with water saving devices (such as faucet aerators, low flow shower heads, toilet displacement bottles/dams, low flow toilets, and automatic shut off faucets).
- o The Town shall submit to the Department, in writing by December 31, 2003, an accounting of all public buildings and their status of compliance with this condition. If any buildings are not retrofitted with water saving devices, the Town shall submit a report and schedule identifying how they plan to complete the retrofitting by December 31, 2005. Thereafter the Town shall implement the plan and schedule.
- o On or before December 31, 2005 the Town shall complete the retrofit of all public buildings and notify the Department in writing that the retrofit is complete.

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Education

- o The Town shall continue its current public education program. The Water Department shall continue to provide its customers with data emphasizing:
 - all the costs of providing water;
 - that investments in efficiency and conservation will provide consumers with long-term savings;
 - how water use fluctuates throughout the year; and
 - the environmental benefits of reducing water demand.

Bill stuffers with water conservation tips or water saving messages shall, at a minimum, be included annually with customer's water bills, or as a separate mailing. Copies of this information shall be made available to the Department upon request.

GENERAL CONDITIONS

1. Duty to Comply The permittee shall comply at all times with the terms and conditions of this Modified Permit, the Act and all applicable State and Federal statutes and regulations.
2. Operation and Maintenance The permittee shall at all times properly operate and maintain all facilities and equipment installed or used to withdraw up to the authorized volume so as not to impair the purposes and interests of the Act.
3. Entry and Inspections The permittee or the permittee's agent shall allow personnel or authorized agents or employees of the Department to enter and examine any property for the purpose of determining compliance with this Modified Permit, the Act or the regulations published pursuant thereto, upon presentation of proper identification and an oral statement of purpose.
4. Water Emergency Withdrawal volumes authorized by this Modified Permit are subject to restriction in any water emergency declared by the Department pursuant to MGL c 21G ss 15-17, MGL c 150 ss 111, or any other enabling authority.
5. Transfer of Permits This Modified Permit shall not be transferred in whole or in part unless and until the Department approves such transfer in writing, pursuant to a transfer application on forms provided by the Department requesting such approval and received by the Department at least thirty (30) days before the effective date of the proposed transfer. No transfer application shall be deemed filed unless it is accompanied by the applicable transfer fee established by 310 CMR 36.37.
6. Duty to Report The permittee shall submit annually, on a form provided by the Department, a certified statement of the withdrawal, such report to be received by the Department by January 31st of each year. Such report must be mailed or hand delivered to:

Department of Environmental Protection
Water Management Program
One Winter Street, 6th Floor
Boston, MA 02108

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7. **Duty to Maintain Records** The permittee shall be responsible for maintaining monthly withdrawal records.
8. **Metering** All withdrawal points included within the permit shall be metered. Master meters shall be calibrated annually.

APPEAL RIGHTS AND TIME LIMITS

This permit modification is a decision of the Department. Any person aggrieved by this decision may request an adjudicatory hearing under the provisions of M.G.L. c. 30A. Any such request must be made in writing, by certified mail and received by the Department within twenty-one (21) days of the date of receipt of this Modified Permit. Only the portions of this Modified Permit that reflect a modification of the Town's current permit may be the subject of an appeal, as the period for appealing provisions within the Town's current permit has expired.

No request for an appeal of this Modified Permit shall be validly filed unless a copy of the request is sent by certified mail, or delivered by hand to the local water resources management official in the city or town in which the withdrawal point is located; and for any person appealing this decision, who is not the permit holder, unless such person notifies the permit holder of the appeal in writing by certified mail or by hand within five (5) days of mailing the appeal to the Department.

CONTENTS OF HEARING REQUEST

310 CMR 1.01(6)(b) requires the request to include a clear and concise statement of the facts which are the grounds for the request and the relief sought. For any person who is not the permit holder, the request must include a clear and concise statement of how that person is aggrieved by the issuance of this Modified Permit.

FILING FEE AND ADDRESS

The hearing request, together with a valid check, payable to the Commonwealth of Massachusetts in the amount of \$100 must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, Ma. 02211

The request shall be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

EXEMPTIONS

The filing fee is not required if the appellant is a city or town (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority.

WAIVER

The Department may waive the adjudicatory hearing filing fee for any person who demonstrates to the satisfaction of the Department that the fee will create an undue financial hardship. A person, seeking a

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waiver must file, together with the hearing request, an affidavit setting forth the facts which support the claim of undue hardship.

NO WITHDRAWAL AUTHORIZED HEREIN SHALL EXCEED THE SAFE YIELD OF THE BASIN AS DETERMINED BY THE DEPARTMENT.

NO WITHDRAWAL IN EXCESS OF 100,000 GALLONS PER DAY OVER THE REGISTERED VOLUME (if any) SHALL BE MADE FOLLOWING THE EXPIRATION OF THIS MODIFIED PERMIT, UNLESS BEFORE THAT DATE THE DEPARTMENT HAS RECEIVED A RENEWAL PERMIT APPLICATION PURSUANT TO 310 CMR 36.00.

**Appendix C:
Model Language for the Implementation
of Report Recommendations**

Model Conservation Commission Regulation Limiting the Installation of Irrigation Wells and Surface Withdrawals in Resource Areas, and the Buffer Zone

Whereas, water withdrawals, impervious surfaces and interbasin transfers have significantly reduced groundwater levels and seasonal surface water levels in wetlands and streams in Westwood and neighboring communities;

Whereas, these hydrologic changes have had significant adverse impacts on the interests of the Massachusetts Wetland Protection Act and Westwood Wetland Protection Bylaw, specifically including the interests in wildlife habitat, pollution prevention, and water supply among others;

Whereas, withdrawals of surface water and ground water for landscape irrigation and other purposes are a major cause of this hydrologic alteration, particularly in light of the cumulative impact of several hundred existing withdrawals within the Town;

Therefore, the Commission shall presume that any public or private withdrawal of surface water or groundwater, within 100 feet of any wetland, floodplain, bank, land under water, land subject to flooding, vernal pond or within the 200-foot riverfront area, will alter and adversely impact those resource areas by further lowering water levels.

This presumption can be overcome only by expert testimony which two thirds of the Commission finds credible. Such evidence would include the results of a pump test with observation wells or other empirical data indicating that the proposed withdrawal is hydrologically isolated from all wetlands, water supplies and surface water features. If the presumption is not overcome, the permit shall be denied unless the applicant can mitigate by a three-fold replacement that matches the location and seasonal pattern of the withdrawal.

Model Amendment to the Dedham Westwood Water District Rules and Regulations Requiring Efficient Irrigation Systems and Practices

A: Definitions:

Temporary Irrigation System: any system connected to the public water supply and installed on a temporary or occasional basis for the purpose of applying supplemental irrigation water to a lawn, or other landscape features. Including a system of garden hoses and sprinkler heads, but not including a hand held hose or watering container.

Permanent Irrigation System: any system connected to the public water supply and installed on a permanent or semi permanent basis for the purpose of applying supplemental irrigation water to a lawn, or other landscape features. Including but not limited to an underground sprinkler system but not including a temporary sprinkler system, hand held hose or watering container.

Automatic Irrigation System: any irrigation system, be it permanent or temporary, connected to the public water supply which is activated automatically without direct initiation by a human operator.

B. Permit Requirements

After the effective date of this regulation, written application shall be filed with the Dedham Westwood Water District, hereinafter “the District, ”prior to the installation of any new permanent or automatic irrigation system, or the expansion of any such system connected to the public water supply. The application shall include such information and plans as are deemed necessary by the District to determine whether the proposed system complies with the applicable performance standards of these regulations. No new or expanded permanent or automatic irrigation system shall be connected to the public water supply until the District has issued a permit approving the proposed system. No permit or application is required for the installation of a temporary irrigation system, however such systems shall comply with all applicable performance standards of these regulations.

C. Temporary Irrigation System Performance Standards

After the effective date of this regulation, all temporary irrigation systems supplied by the public water supply shall meet the following requirements:

- The operation of such a system shall not be automatically initiated by a timing device, unless the system meets all the additional performance standards for an automatic irrigation system.
- The system shall utilize sprinklers heads designed to distribute water as evenly as possible.
- The system shall include a mechanism (i.e. a irrigation gauge or rain gauge) for accurately determining how much water has been applied during a given irrigation session.

- The system shall be operated so as to apply water to a given property or zone on only one day per week, on a day when watering is allowed by any applicable water use restrictions.
- The system shall be operated so that the combination of natural rainfall during the prior seven days and irrigation water applied will not total more than one inch of water per week. For example if there has been 1/4 inches of rain in the preceding seven days, the irrigation system shall apply no more than 3/4 inches of water on the day it operates that week.
- The system shall not apply water to any streets, driveways, sidewalks or other impervious surfaces, nor shall it cause water to run off onto such surfaces.
- The operation of such a system shall be immediately suspended during rainstorms or when rainstorms are imminent.
- The system shall be shut off at the house when not in use to preclude the possibility of leaks during times when the system is not in operation.
- The system shall be inspected for leaks and compliance with these regulations at each deployment.

D. Permanent Irrigation Systems

After the effective date of this regulation, all new or expanded permanent irrigation systems supplied by the public water supply shall meet all the criteria described above for temporary irrigation systems, and:

- The system shall be designed with sprinkler heads matched to the size and shape of the area which they will service, in order to achieve a coefficient of uniformity of 80% or better.
- The system shall incorporate a master shutoff valve directly connected to the controller to preclude the possibility of leaks during times when it is not in operation.
- The system shall include a backflow prevention device.
- The system shall be inspected for leaks, proper sprinkler head function and compliance with these regulations at least once per year.

E. Automatic Irrigation Systems

After the effective date of this regulation, all new or expanded automatic irrigation systems supplied by the public water supply, shall meet the applicable standards for permanent or temporary irrigation systems and shall also meet the following additional requirements

- Under no circumstances will the system apply more than 1” of supplemental water per week to any property or zone.
- The system shall be controlled by a rain sensor switch, which shuts the system off after 1/8 inch of rainfall.
- The system shall also be controlled by a timing device that allows the system (or each individual zone) on only one day per week, on a day when watering is allowed by any applicable water use restrictions.
- The system shall be further controlled by one or more soil moisture sensors that will prohibit operation of the system (or individual zones) until measured soil

- moisture levels indicate that supplemental water is needed to maintain the specific plant species being irrigated.
- The system shall incorporate an automatic master shutoff valve directly connected to the controller to preclude the possibility of leaks during times when it is not in operation.
 - The system shall be inspected for leaks, proper sprinkler head function and compliance with these regulations at least once per year.

F. Existing Irrigation Systems

All permanent or automatic sprinkler systems supplied by the public water supply which are already in existence as of the effective date of this regulation may continue in operation. Any such system shall, however, be registered with the Dedham Westwood Water District within six months from the effective date of this regulation or the following April first, whichever comes later. When a property with such a system is sold, the irrigation system shall be upgraded to meet the requirements for a new system. The owners of such systems are strongly encouraged to immediately comply with these irrigation system performance standards on a voluntary basis, as these requirements represent industry best practices for the responsible use of limited water supplies and protection of wetland wildlife.

G. Administration and Enforcement

The Dedham Westwood Water District may establish and collect fees for any or all of the requirements of this regulation. The excess of fees collected over an above the cost of administration shall be set aside for use in the promotion of water conservation.

The penalties for customers and/or irrigation system installation contractors who install or operate a system in violation of the provisions of this regulation shall be, remediation of the violation and:

First Violation: Warning

Second Violation: \$100 fine

Third and Additional Violations: \$250 and discontinuance of water service. A reactivation fee of \$250 will be charged before water service is restored. In the case of installers, future applications for system installation shall be denied.

Each day or portion thereof during which a violation continues shall constitute a separate offense, and each provision of the regulations or orders violated shall constitute a separate offense.

Model Amendment to the Westwood Board of Health Private Well Regulations Requiring Efficient Irrigation Systems and Practices

A: Definitions:

Temporary Irrigation System: any system connected to a private well and installed on a temporary or occasional basis for the purpose of applying supplemental irrigation water to a lawn, or other landscape features. Including a system of garden hoses and sprinkler heads, but not including a hand held hose or watering container.

Permanent Irrigation System: any system connected to a private well and installed on a permanent or semi permanent basis for the purpose of applying supplemental irrigation water to a lawn, or other landscape features. Including but not limited to an underground sprinkler system but not including a temporary sprinkler system, hand held hose or watering container.

Automatic Irrigation System: any irrigation system, be it permanent or temporary, connected to a private well which is activated automatically without direct initiation by a human operator.

B. Permit Requirements

After the effective date of this regulation, written application shall be filed with the Westwood Board of Health, hereinafter “the Board,” prior to the installation of any new permanent or automatic irrigation system, or the expansion of any such system connected to a private well. The application shall include such information and plans as are deemed necessary by the Board to determine whether the proposed system complies with the applicable performance standards of these regulations. No new or expanded permanent or automatic irrigation system shall be connected to a private well until the District has issued a permit approving the proposed system. No permit or application is required for the installation of a temporary irrigation system, however such systems shall comply with all applicable performance standards of these regulations.

C. Temporary Irrigation System Performance Standards

After the effective date of this regulation, all temporary irrigation systems supplied by a private well shall meet the following requirements:

- The operation of such a system shall not be automatically initiated by a timing device, unless the system meets all the additional performance standards for an automatic irrigation system.
- The system shall utilize sprinklers heads designed to distribute water as evenly as possible.
- The system shall include a mechanism (i.e. a irrigation gauge or rain gauge) for accurately determining how much water has been applied during a given irrigation session.
- The system shall be operated so as to apply water to a given property or zone on only one day per week, on a day when watering is allowed by any applicable water use restrictions.

- The system shall be operated so that the combination of natural rainfall during the prior seven days and irrigation water applied will not total more than one inch of water per week. For example if there has been 1/4 inches of rain in the preceding seven days, the irrigation system shall apply no more than 3/4 inches of water on the day it operates that week.
- The system shall not apply water to any streets, driveways, sidewalks or other impervious surfaces, nor shall it cause water to run off onto such surfaces.
- The operation of such a system shall be immediately suspended during rainstorms or when rainstorms are imminent.
- The system shall be shut off at the house when not in use to preclude the possibility of leaks during times when the system is not in operation.
- The system shall be inspected for leaks and compliance with these regulations at each deployment.

D. Permanent Irrigation Systems

After the effective date of this regulation, all new or expanded permanent irrigation systems supplied by a private well shall meet all the criteria described above for temporary irrigation systems, and:

- The system shall be designed with sprinkler heads matched to the size and shape of the area which they will service, in order to achieve a coefficient of uniformity of 80% or better.
- The system shall incorporate a master shutoff valve directly connected to the controller to preclude the possibility of leaks during times when it is not in operation.
- The system shall include a backflow prevention device.
- The system shall be inspected for leaks, proper sprinkler head function and compliance with these regulations at least once per year.

E. Automatic Irrigation Systems

After the effective date of this regulation, all new or expanded automatic irrigation systems supplied by a private well, shall meet the applicable standards for permanent or temporary irrigation systems and shall also meet the following additional requirements:

- Under no circumstances will the system apply more than 1” of supplemental water per week to any property or zone.
- The system shall be controlled by a rain sensor switch, which shuts the system off after 1/8 inch of rainfall.
- The system shall also be controlled by a timing device that allows the system (or each individual zone) on only one day per week, on a day when watering is allowed by any applicable water use restrictions.
- The system shall be further controlled by one or more soil moisture sensors that will prohibit operation of the system (or individual zones) until measured soil moisture levels indicate that supplemental water is needed to maintain the specific plant species being irrigated.
- The system shall incorporate an automatic master shutoff valve directly connected to the controller to preclude the possibility of leaks during times when it is not in operation.

- The system shall be inspected for leaks, proper sprinkler head function and compliance with these regulations at least once per year.

F. Existing Irrigation Systems

All permanent or automatic sprinkler systems supplied by a private well which are already in existence as of the effective date of this regulation may continue in operation. Any such system shall, however, be registered with the Board within six months from the effective date of this regulation or the following April first, whichever comes later. When a property with such a system is sold, the irrigation system shall be upgraded to meet the requirements for a new system. The owners of such systems are strongly encouraged to immediately comply with these irrigation system performance standards on a voluntary basis, as these requirements represent industry best practices for the responsible use of limited water supplies and protection of wetland wildlife.

G. Administration and Enforcement

The Board may establish and collect fees for any or all of the requirements of this regulation.

The penalties for private well owners and/or irrigation system installation contractors who install or operate a system in violation of the provisions of this regulation shall be, remediation of the violation and:

- First Violation: Warning
- Second Violation: \$100 fine
- Third and Additional Violations: \$250 and discontinuance of water service. A reactivation fee of \$250 will be charged before water service is restored. In the case of installers, future applications for system installation shall be denied.

Each day or portion thereof during which a violation continues shall constitute a separate offense, and each provision of the regulations or orders violated shall constitute a separate offense.

H. Applicability

The requirements of this section shall not apply to irrigation systems supplied by a private well already subject to regulation by the Department of Environmental Protection under the Massachusetts Water Management Act, or to an irrigation system used for commercial agriculture as defined in GL Ch. 128, s. 1A. The owners of such systems are however strongly encouraged to comply with these irrigation system performance standards on a voluntary basis to the maximum extent practicable, as these requirements represent industry best practices for the responsible use of limited water supplies and protection of wetland wildlife.

**Model Town of Westwood Bylaw
Establishing Outdoor Water Use Restrictions
for Private Well Users during Periods of Hydrologic Stress**

Purpose: To preserve the town's limited groundwater supplies during periods of drought for the priority uses of public (non irrigation) water supply, fire protection, wildlife protection, pollution prevention and the discouragement of mosquito breeding.

Whenever the Dedham Westwood Water District declares a ban on the outdoor use of water for lawn and landscape irrigation or other purposes in response to drought or hydrologic stress observed in aquifers, the Charles or Neponset Rivers or their tributaries, the outdoor use of water drawn from private wells shall be subject to the same restrictions as to timing, frequency, purpose and manner of use as may be imposed on users of the public water supply.

The requirements of this section shall not apply to irrigation systems supplied by a private well subject to regulation by the Department of Environmental Protection under the Massachusetts Water Management Act, or to an irrigation system used for commercial agriculture as defined in GL Ch. 128, s. 1A.

Anyone violating any portion of this bylaw shall be subject to a warning for the first offense, a fine of \$100 for the second offense, and a fine of \$250 for the third or subsequent offense. Every day, or portion thereof that the offense continues, and each provision violated, shall constitute a separate offense. As an alternative to criminal charges, the bylaw may be enforced through non-criminal citations issued under GL Ch. 40, s. 21D, as set out in section 23 of the town's bylaws.

The Westwood Police and agents of the Conservation Commission are hereby added to those persons named in s. 23 of the town's bylaws as authorized to enforce section 21D in appropriate cases.